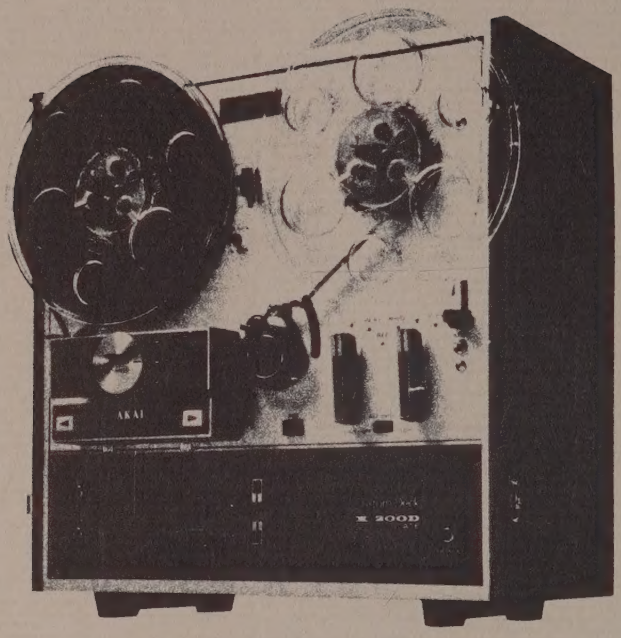
SERVICE
and
Parts
Manual

AKAI MODEL
X200D
M10
ROBERTS MODEL
650XD
800X



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I. SPECIFICATIONS X-200D M-10

STYLE : Portable
WEIGHT : 37.4 lbs (17 kg)
DIMENSIONS : 14" x 14" x 8-7/8"
(358 x 358 x 227 mm)
POWER SUPPLY : AC 100 to 240 V, 50/60 Hz
RECORDING SYSTEM
: In-line 4-track stereo, monaural recording by using Cross-field Bias Head.
PLAYBACK SYSTEM
: IN-line 4-track stereo, monaural playback.
TAPE SPEED : 1-7/8, 3-3/4 and 7-1/2 ips.
TAPE SPEED DEVIATION
: Within ± 0.8%
WOW AND FLUTTER
(Playback only) : Less than 0.1% r.m.s. at 7-1/2 ips.
Less than 0.2% r.m.s. at 3-3/4 ips.
Less than 0.3% r.m.s. at 1-7/8 ips.
FREQUENCY RESPONSE
: 30 to 25,000 Hz ± 3 db at 7-1/2 ips.
30 to 18,000 Hz ± 3 db at 3-3/4 ips.
40 to 9,000 Hz ± 4 db at 1-7/8 ips.
SIGNAL TO NOISE RATIO
: Better than 48 db (Forward Operation)
Better than 45 db (Reverse Operation)
DISTORTION : Within 3% at Line Output, 1,000 Hz 0 VU Recording and Playback.
CROSS TALK : Less than −65 db (Monaural)
Less than −43 db (Stereo)
ERASE RATIO : Less than −70 db
INSULATION RESISTANCE :
More than 50 M.Ohms
INSULATION DURABILITY
: 500 V. AC for more than one minute duration.
LINE OUTPUT : Output Impedance ..... 100 Ohms.
Required load impedance more than 25 K.Ohms. .
1.23 V (+4 dbs)
DIN OUTPUT : 0.4 V
Output Impedance ..... 10 K.Ohms.
Required load impedance more than 50 K.Ohms.
LINE INPUT : Above 50 mV (−25 dbs)
Impedance ..... 175 K.Ohms.
DIN INPUT : High ..... Above 50 mV (−25 dbs)
Impedance ..... 150 K.Ohms.
Low ..... Above 5 mV (−45 dbs)
Impedance ..... 27 K.Ohms.
MIC. INPUT : Above 0.5 mV (−65 dbs)
Impedance ..... 4.7 K.Ohms.
FAST FORWARD AND REWIND TIME
85 seconds for a full 1,200 foot tape at 50 Hz.
65 seconds for a full 1,200 foot tape at 60 Hz.

MONITOR SYSTEM : The program being recorded can be monitored by using,
Stereo Headphone (8 Ohms)
.....Stereo Headphone Jack.
Crystal Receiver . . Line Output Jack.

MOTORS
CAPSTAN MOTOR
: Hysteresis Synchronous 3-speed (2-4-8 pole) motor
Condenser Capacity 3 μF (50 Hz)
2 μF (60 Hz)
Revolution : 3,000 − 1,500 − 750 r.p.m. (50 Hz)
3,600 − 1,800 − 900 r.p.m. (60 Hz)
REEL MOTOR
: Two 6-pole eddy current outer-rotor motors.
Revolutions : 930 r.p.m. at 50 Hz 100 V
1,120 r.p.m. at 60 Hz 110 V
HEADS
REC/PLAY HEAD
: In-line 4-track stereo and monaural
Impedance . . . 1,200 Ohms at 1,000 Hz.
Gap ..... 2/1,000 mm
ERASE HEAD: In-line 4-track stereo
Impedance ..... 500 Ohms at 60 KHz.
Gap ..... 0.2 mm
BIAS HEAD : In-line 4-track stereo
Impedance ..... 500 Ohms at 60 KHz.
Gap ..... 0.2 mm
RECORDING LEVEL INDICATOR
: VERTICAL Indication model, "A" VU Meter x 2

X-200D

TRANSISTOR USED : 4 2SC693FU, 5 2SC372, 2 2SC458 (B), 2 2SC971, 2 ICAA-072D, 1 2SD223
DIODE USED : 1 SB-3-01P, 3 IN34A, 1 10D4, 8 IN46A, 3 V06C, 1 RD24A (M)
REELS USED : 7", 5", 3" reels
10-1/2" Reel Adaptor available (optional accessory)

M-10

TRANSISTOR & IC USED : 2 ICAA-072D, 4 2SD92, 2 2SC458 (B), 7 2SC372, 4 2SC693FU, 4 2SC971, 1 2SD223
DIODE USED : 1 SB-3-01P, 3 IN34A, 1 10D4, 1 5B2, 4 V06C, 1 RD24A (M)

II. MEASURING METHOD

TAPE SPEED DEVIATION

1. Method involving use of pre-recorded tape.

For measuring the tape speed deviation, play back the pre-recorded tape at 1,000 Hz ± 0.1%. Connect the appropriate output to a frequency counter meter in order to measure the tape speed deviation from the resulting deviation of the measured frequency.

2. Method involving use of timing tape. (designed for tape speed measurement)

This method utilizes a timing tape marked at intervals of 7-1/2". The running time of over 60 marked sections of tape is measured in order to calculate the deviation of the tape speed. In applying this method, however, it should be kept in mind that the timing tape stretch or contract measurement error is inevitable, so that it is necessary to measure the total length of the tape in advance.

WOW AND FLUTTER

Playback the 3,000 Hz pre-recorded tape of which the wow and flutter level is guaranteed to be smaller than 0.07% for measurement by means of a wow meter. It is also possible for a 3,000 Hz sine wave to be recorded and played for measurement by means of the wow meter. In this case, however, the wow meter indicates a value as much as twice the value given in the specifications on the first page.

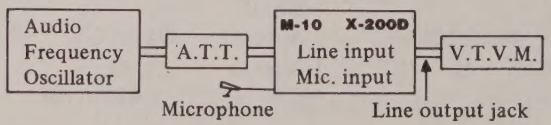
FREQUENCY RESPONSE

RECORD :

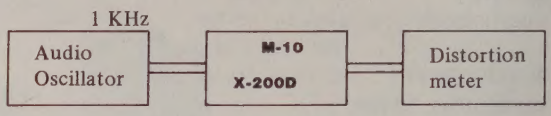
1) Give a sine wave of 1,000 Hz to the Line Input of the recorder to be tested through an attenuator from an audio frequency generator.
2) Set the Record/Playback Knob to "Rec" position and adjust the line input volume so that the VU Meter needle indicates "0" VU.
3) Set the Equalizer Switch to 7-1/2" or 3-3/4" position.
4) Under the condition described in (2), lower the input level 16 db by means of the attenuator.
5) Record the spot frequency in the range of 30 Hz to 25,000 Hz from the audio frequency generator.

PLAYBACK :

6) Set the Record/Playback Knob to "Play" position.
7) Connect a Vacuum Tube Volt Meter to the Line Output Jack. (VTVM with milli volt scale.)
8) Playback the recorded tape.
9) Playback the recorded spot frequencies and make a memo of output level and plot the value on a graph.



TOTAL HARMONIC DISTORTION FACTOR



Connect the measuring instrument as shown above, and record the 1,000 Hz sine wave at "0" VU. Playback the resulting signal and measure the overall distortion factor. Measure the noise level of the tape recorder with the tape removed ; connect the audio oscillator directly to the distortion meter for measurement of the distortion factor of the oscillator.

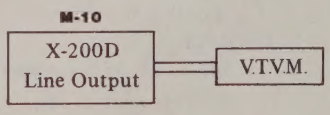
The required distortion factor may be obtained from the results of the above measurement by the following formula :

$$d_0 = d - d_1 - d_2$$

where, d_0 = Required
d = Overall distortion factor
d_1 = Noise level
d_2 = Distortion factor of the oscillator

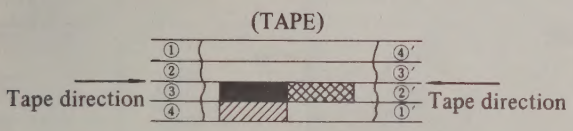
(Note : New tape of particularly good quality should be used for measurement of the distortion factor.)

SIGNAL TO NOISE RATIO



Set the Equalizer Switch to "7-1/2 ips" position and playback a tape containing a 250 Hz sine wave recorded at "0" VU level on a standard recorder. Connect a V.T.V.M. to the line output jack of the recorder and measure its output. Then remove the tape and measure the noise level under the same condition. Convert into decibels each of the measured values.

CROSSTALK (Crosstalk between the tracks)

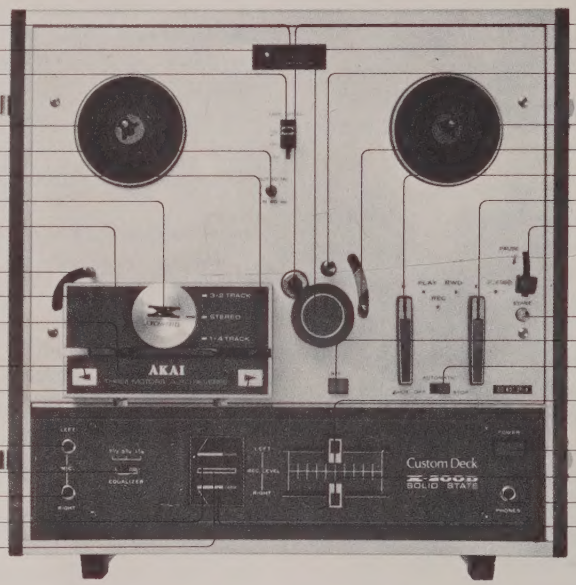


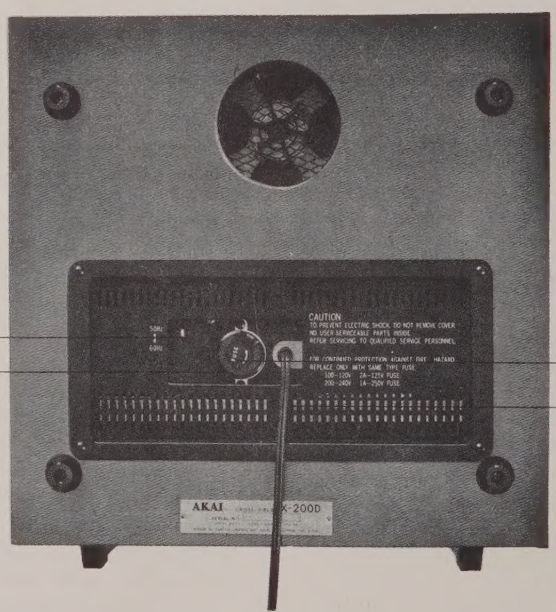
As shown in the figure, first record a 1,000 Hz sine wave on track No. 3 at +3 VU level. Next, remove the 1,000 Hz input signal and record under a non-input condition. Then, Playback the tape on track No. 3 and No. 1 (reversed condition of tape) through the 1,000 Hz B.P.F. (Band Pass Filter, Sensitivity . . . 1 : 1) and obtain a ratio between the two from the following formula.

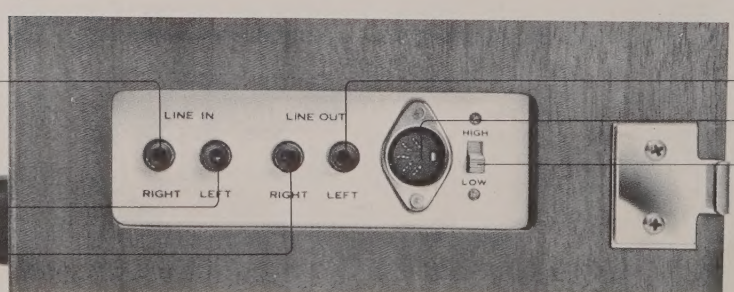
$$C = 20 \log \frac{E_0}{E_2 - E_1} \text{ (db)}$$

C = Desired crosstalk ratio (db)
E_0 = 1,000 Hz signal output level
E_2 = 1,000 Hz crosstalk output level
E_1 = Non-input signal record level

III. CONTROL LOCATIONS X-200D





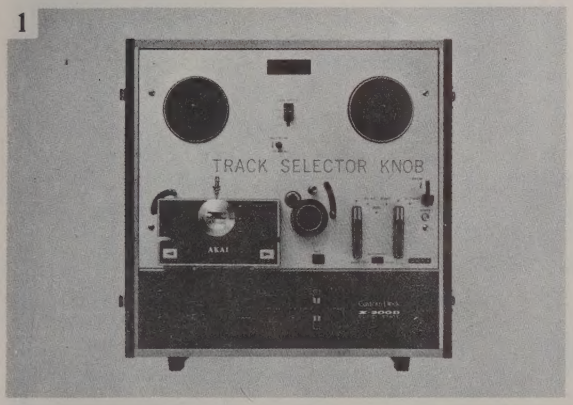


IV. DISMANTLING OF TAPE TRANSPORT UNIT & AMPLIFIERS X-200D

In case of trouble, etc. necessitating disassembly, please disassemble in the order shown in photographs.

Remantle in reverse order.

1



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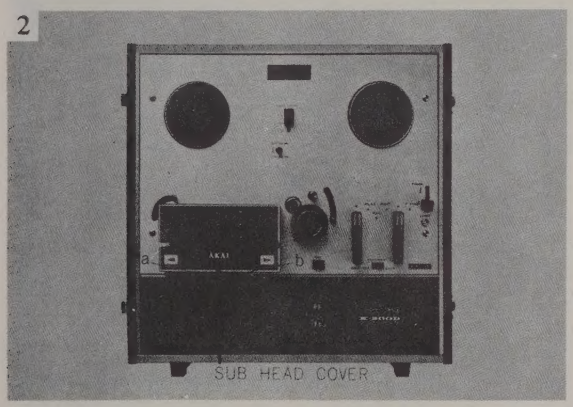

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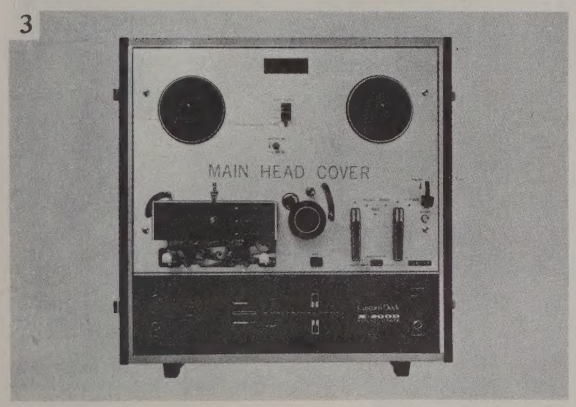

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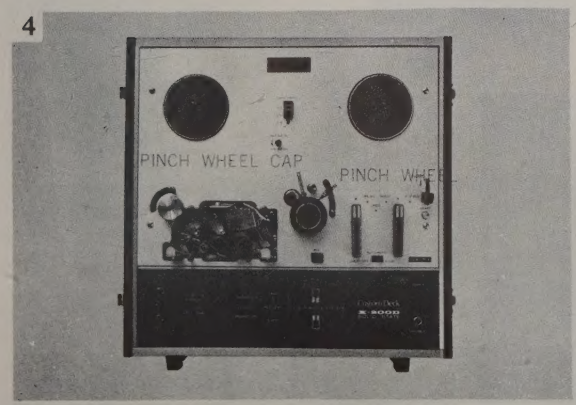

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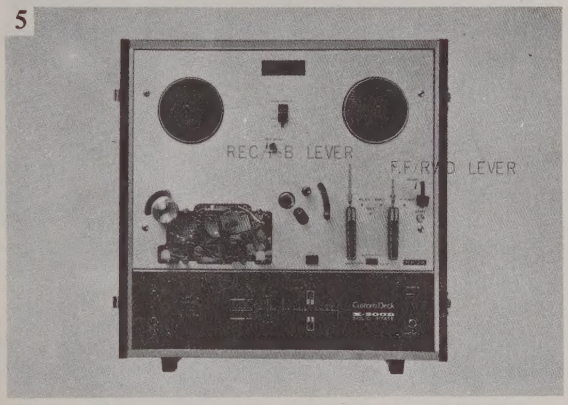

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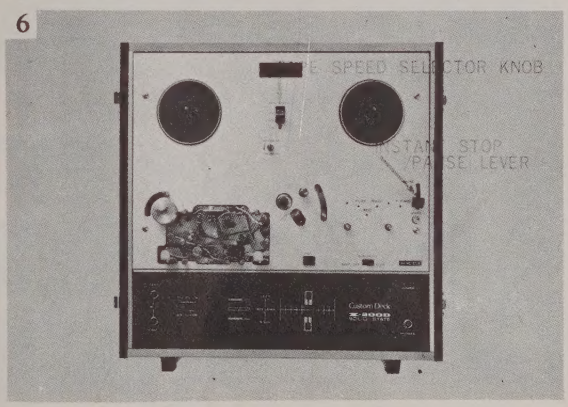

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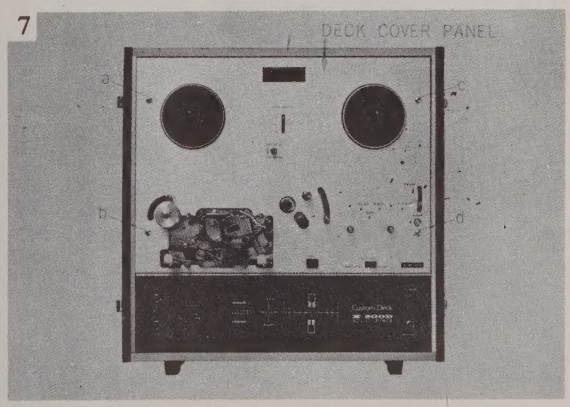

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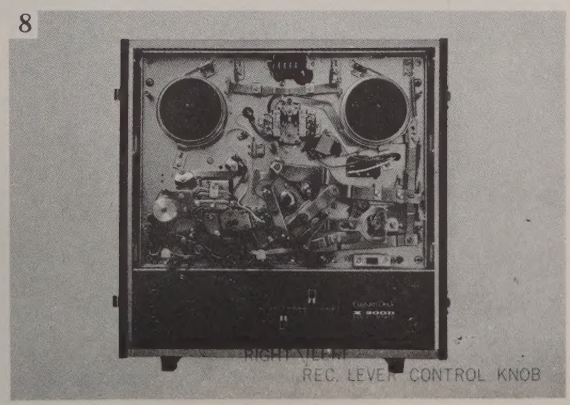

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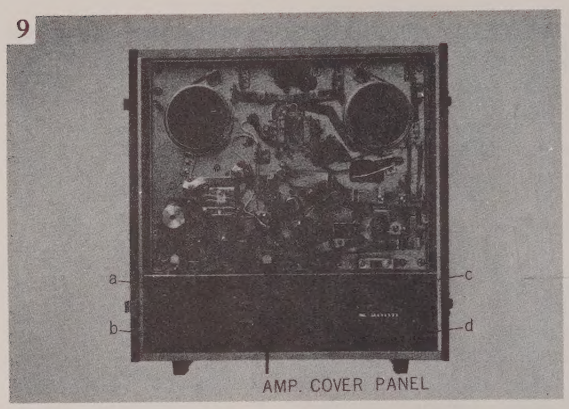

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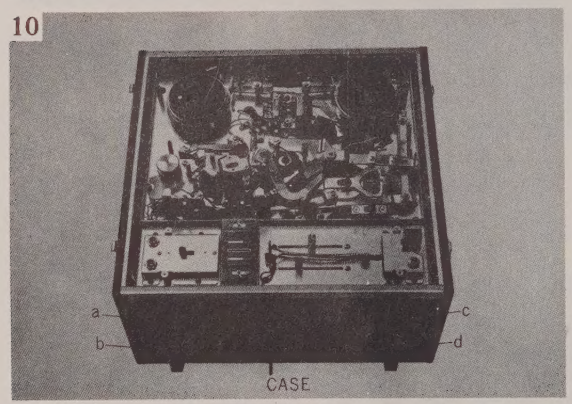

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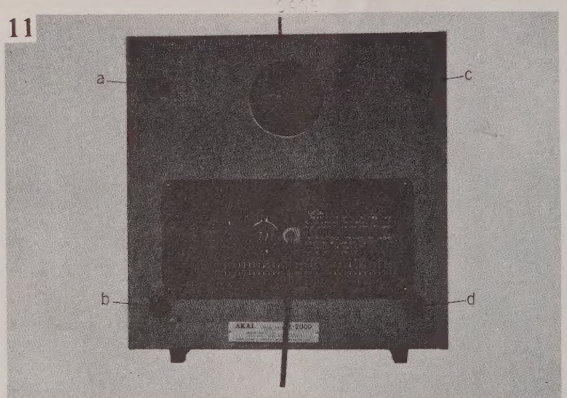

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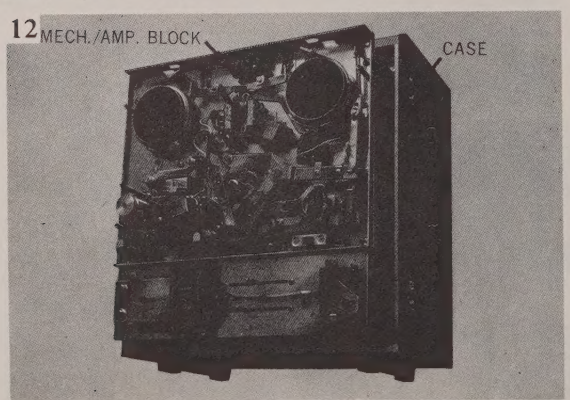

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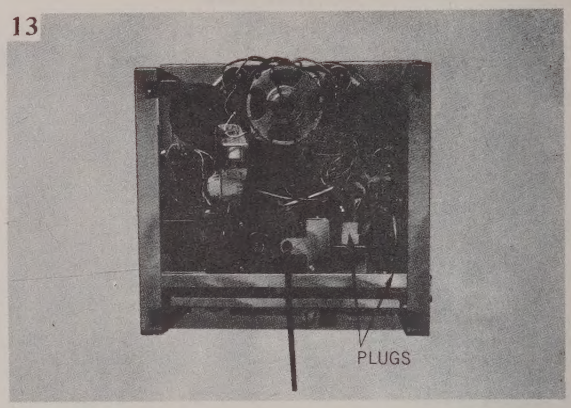

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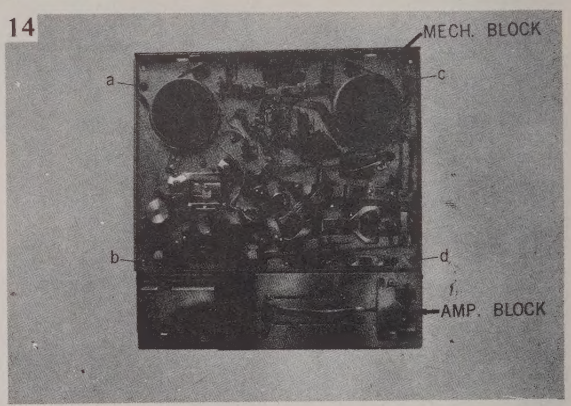

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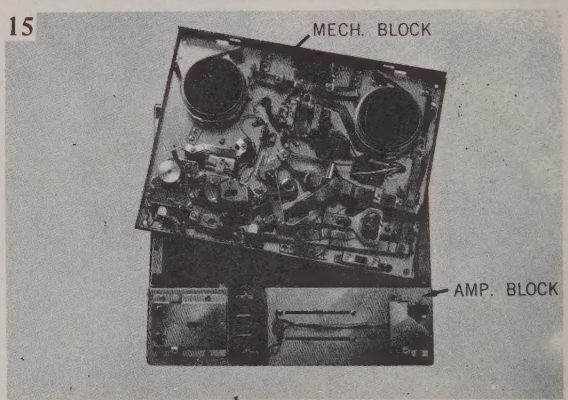
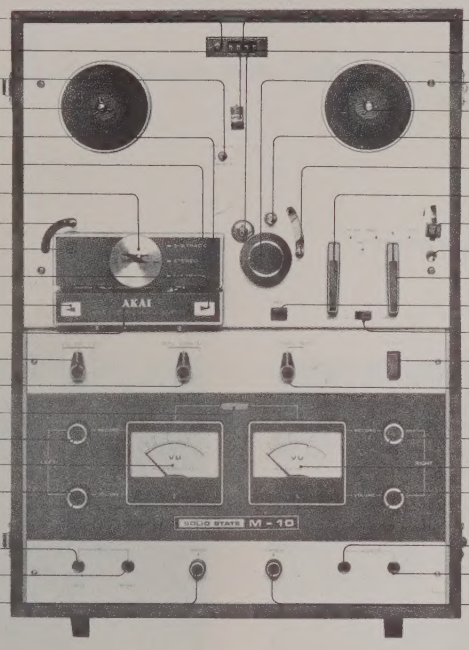
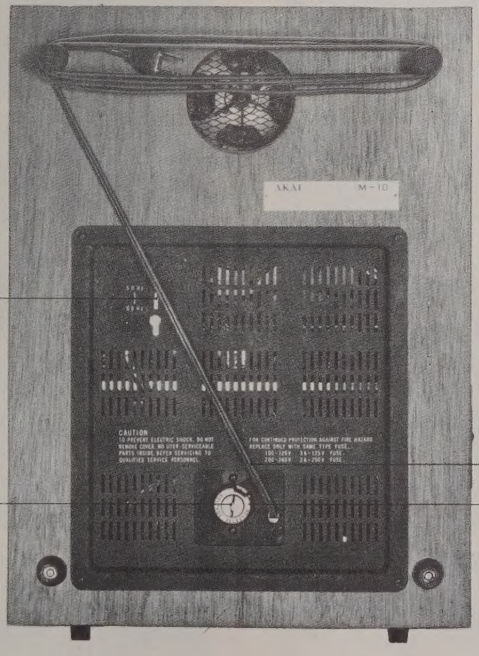


III. CONTROL LOCATIONS M-10



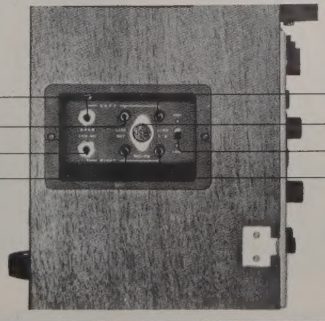
Reset Button
Tape Speed Selector
Cycle Conversion Switch (A)
Supply Reel Shaft
Sensing Pin (A)
Main Head Cover
Track Selector
Tension Arm & Sensing Pin (B)
Tape Guide
Manual Reverse Button (● Direction)
Manual Reverse Button (■ Direction)
Sub Head Cover
Equalizer Switch
Record Mode Switch
Record Indicator Lamp
Record Level Control (Left)
VU Meter (Left)
Volume Control (Left)
Microphone Jack (Left)
Microphone Jack (Right)
Bass Control

Index Counter
Capstan Shaft
Pinch Wheel
Take-up Reel Shaft
Tape Holder
Take-up Tension Arm
Record/Playback lever
Instant Stop/Pause Lever
Start Button
Fast Forward/Rewind Lever
Record Interlock Button
Automatic Shut-off Switch
Power Switch
Function Switch
Record Leve Control (Right)
VU Meter (Right)
Volume Control (Right)
Headphone Jack (B)
Headphone Jack (A)
Treble Control



Cycle Conversion Switch (B)
Fuse Post

AC Cord
Voltage Selector



External Speaker Jack (Left)
Line Output Jack (Left)
External Speaker Jack (Right)
Line Output Jack (Right)

Line Input Jack (Left)
Din Jack
HIGH/LOW Input Selector
Line Input Jack (Right)

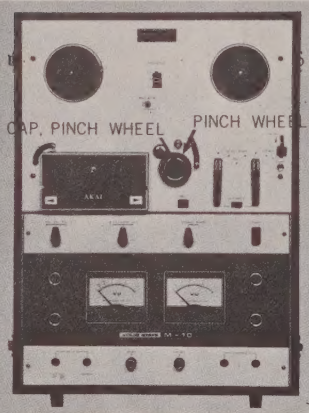
IV. DISMANTLING OF TAPE TRANSPORT UNIT & AMPLIFIERS M-10

In case of trouble, etc, necessitating disassembly, please disassemble in the order shown in photographs. Remantle in reverse order.

DISASSEMBLY OF TAPE TRANSPORT

1

2



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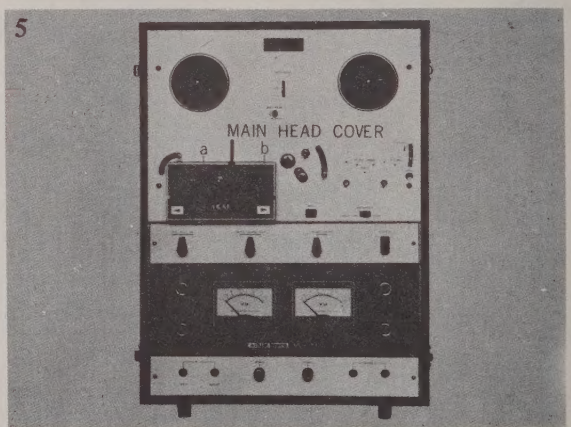

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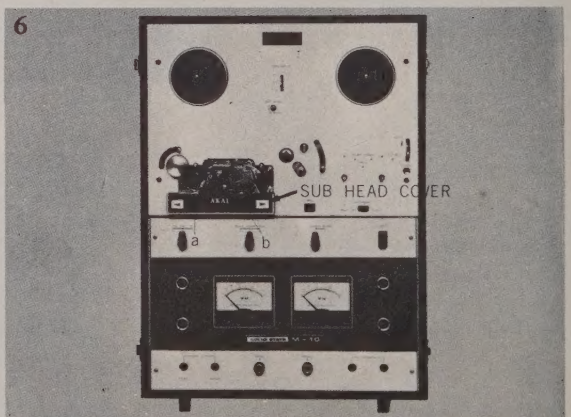

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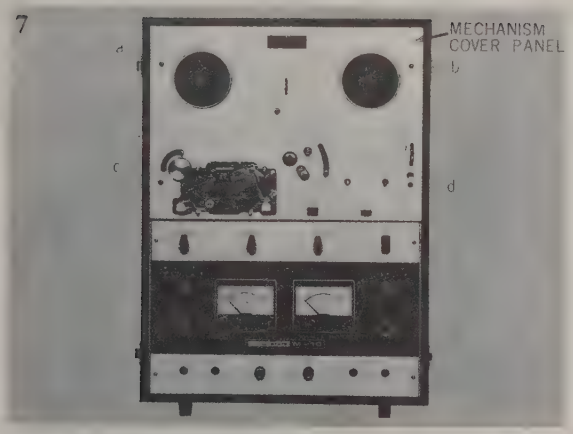
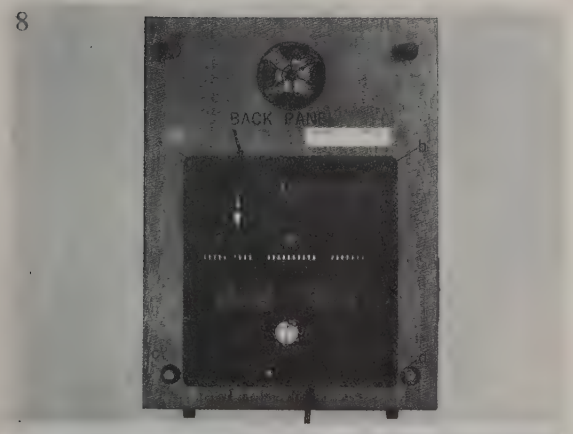

MECHANISM
COVER PANEL
b
d

8


BACK PANEL
b

9

10

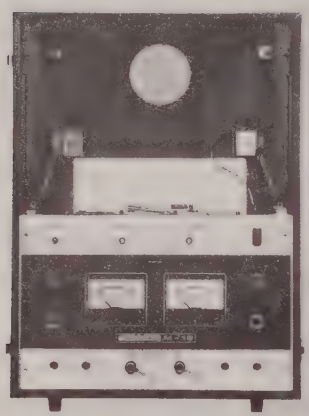
MECHANISM
BLOCK

11

MECHANISM
BLOCK
CASE BLOCK

12

13



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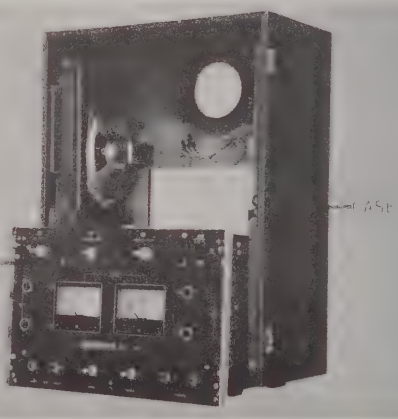

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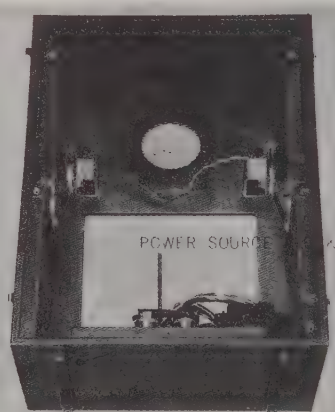
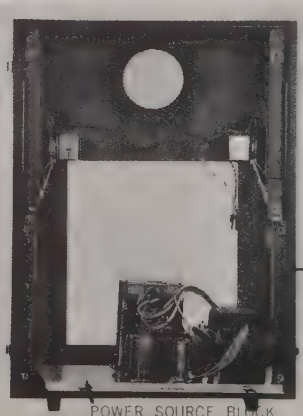


19



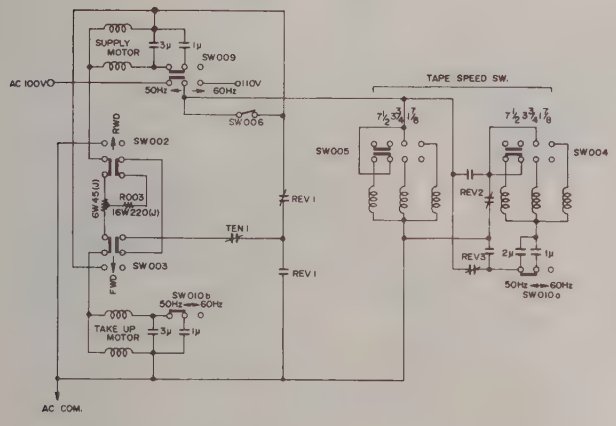


Fig. 5-1

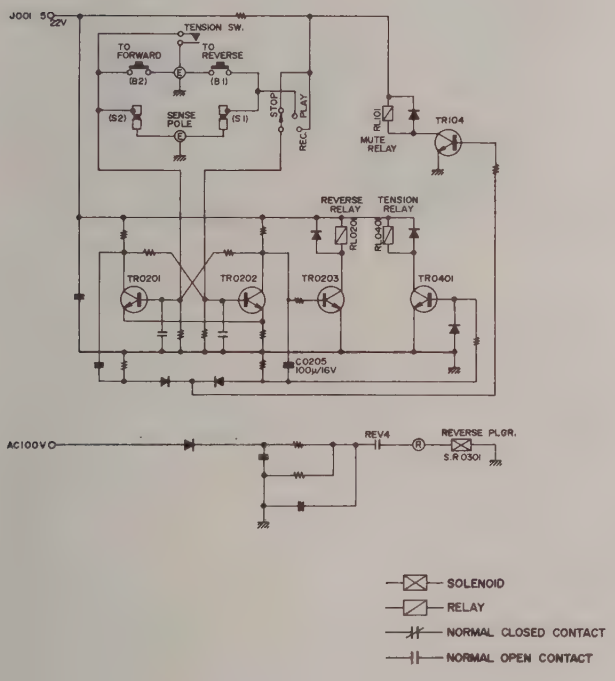


Fig. 5-2

1. SUPPLY VOLTAGE OF BOTH TORQUE MOTORS DURING RECORDING/PLAYBACK

	SUPPLY	TAKE-UP
Normal Play	30 V (50 to 60 gr)	60 V (180 gr)
First 4 to 8 sec. of reverse	47 V (100 gr)	47 V (100 gr)
Reverse	60 V (180 gr)	30 V (50 to 60 gr)
RW-FF	100 V	100 V

2. PINCH ROLLER PRESSURE 1.5 Kgr TO 1.8 Kgr.

Recording/Playback (Normal Recording)

Set Recording/Playback Knob (A) to Playback Position. The Pinch Roller presses against Capstan to move the tape at the rated speed. The Brake Levers free the Brake and the Lever Spring (G) turns "ON" Microswitch (SW006) (F) so that both torque motors become operative (as shown in diagram illustration).

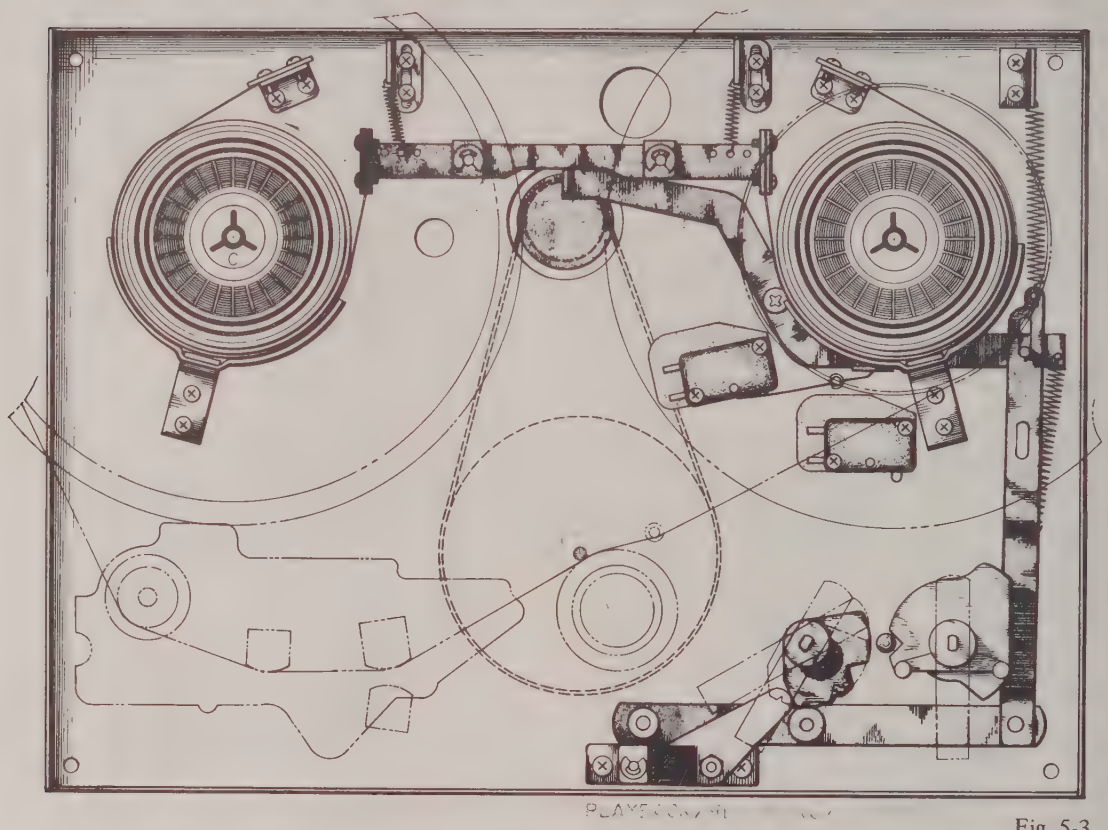


Fig. 5-3

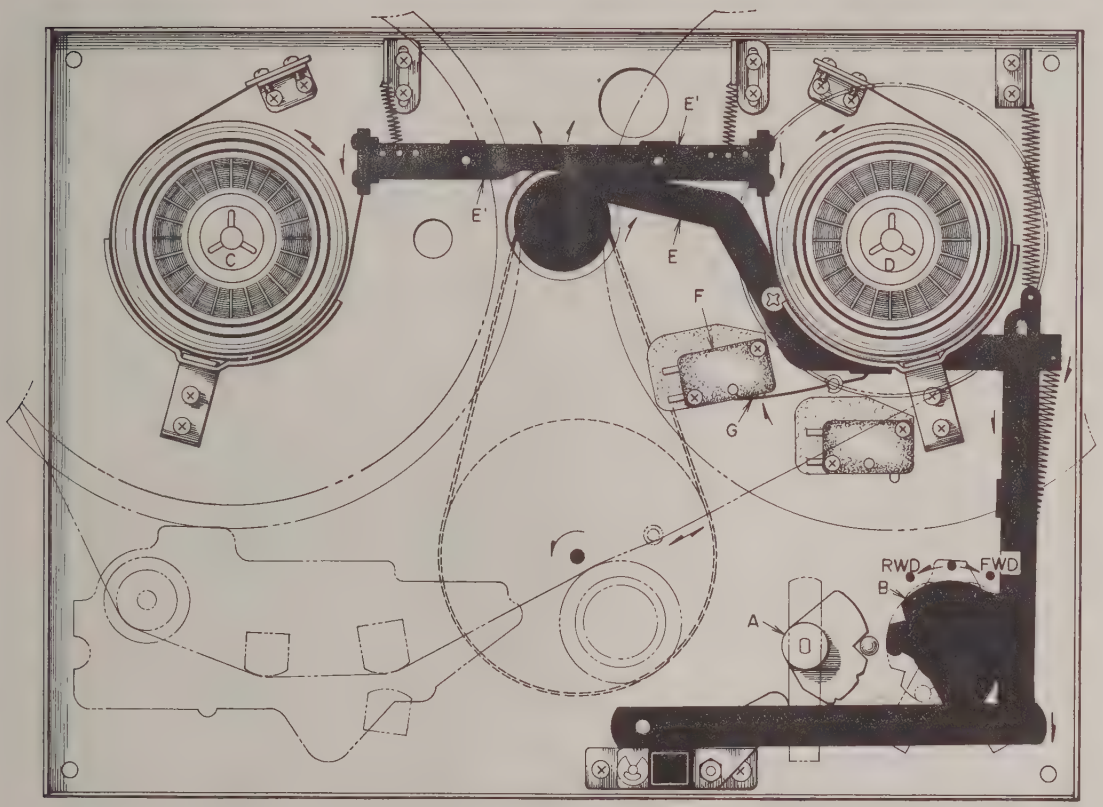
3. REVERSE (BLOCK DIAGRAM ILLUSTRATION)

At Playback position, when Reverse button (B) is depressed or the sensing tape passes the sensing pole (S_1), the base of TR0202 is grounded. The operation of TR0202 is stopped and the voltage sent to the base of TR0203 and operates it. Reverse Relay RL0201 is actuated and Reverse is effected.

At the same time, the discharge current of Condenser C0205 (100M/16V) actuates TR0401 and TR104 which assume operating position within a period of from 4 to 8 seconds.

Tension Relay (RL0401) is actuated and a higher voltage than during reverse playback time (47 V) is supplied to the Take-Up torque motor. At the sametime Mute Relay (CRL1017) mutes the playback output signal.

Plunger (SR0301) operates and lowers the playback head.



FAST–FORWARD/REWIND Fig. 5-4

4. FAST FORWARD

When Fast Forward/Rewind Knob is set to Forward position, SW003 (block diagram) enters forward position. Brake Levers (E) (E) free brake. Lever Spring (G) turns "ON" Microswitch (F) and the TAKE-UP Torque Motor rotates.

5. REWIND

When Fast Forward/Rewind Knob is set to Rewind position, SW002 (block diagram enters rewind position. Brake Levers (E) (E) free Brake. Lever Spring (G) turns "ON" Microswitch (F) and the SUPPLY Torque Motor rotates.

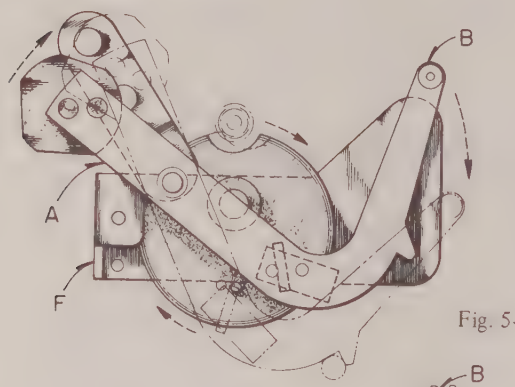


Fig. 5-5

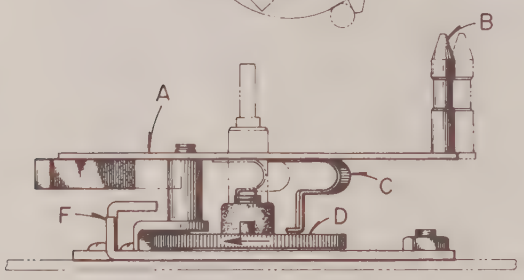


Fig. 5-6

AUTOMATIC STOP MECHANISM

When the tape is threaded on the pin (B) at the top of the Automatic Stop Lever (A) comes off the pin, the Automatic Stop lever returns to the original position by the action of springs. At this time, the panel spring (C) below the Automatic Stop lever slightly pushes down the projected part of the eccentric gear (D), which gears into the Flywheel Gear (E) to start rotating and pushing up the Instant Stop Lever (G) that is connected with the eccentric gear base (F).

Thus, the eccentric gear maintains the mechanism in the state of tentative stop for "Playback" or "Recording". For "Fast-forward", or "Rewind", the Corkscrew lever (H) works to push back the "FAST FWD, REWIND" knob to the "Stop" position before stopping itself.

When the Automatic Shut-OFF Switch is moved to "SHUT OFF" position, the Shut-Off Lever (J) moves to the arrow-mark direction to cut the power circuit, thereby depressing the attached Micro Switch (K) to shut off the current.

(See Fig. 5-5 to Fig. 5-8)

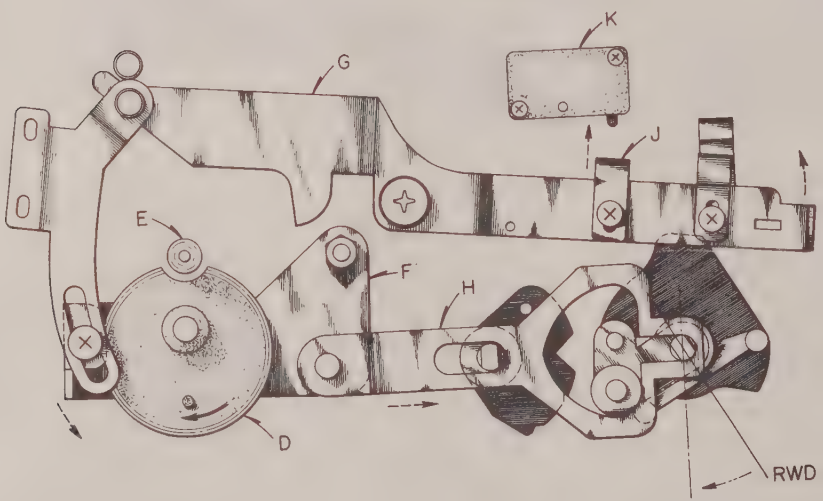


Fig. 5-7

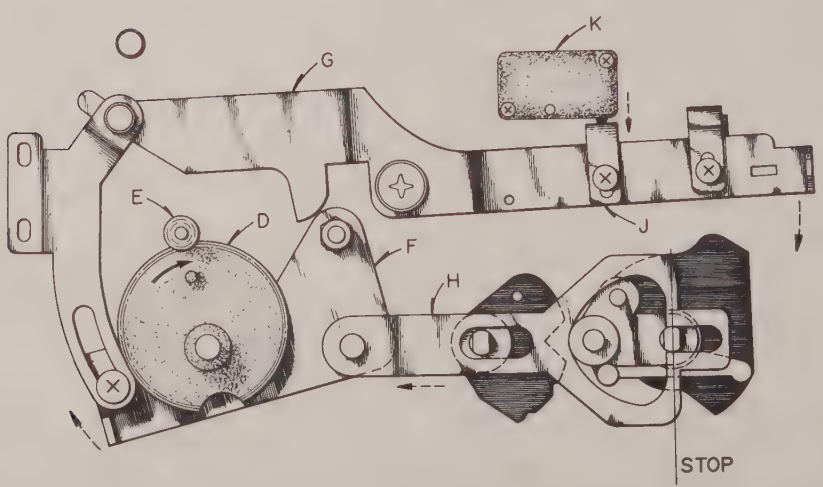


Fig. 5-8

ILLUSTRATION OF 4TR X-FIELD HEAD

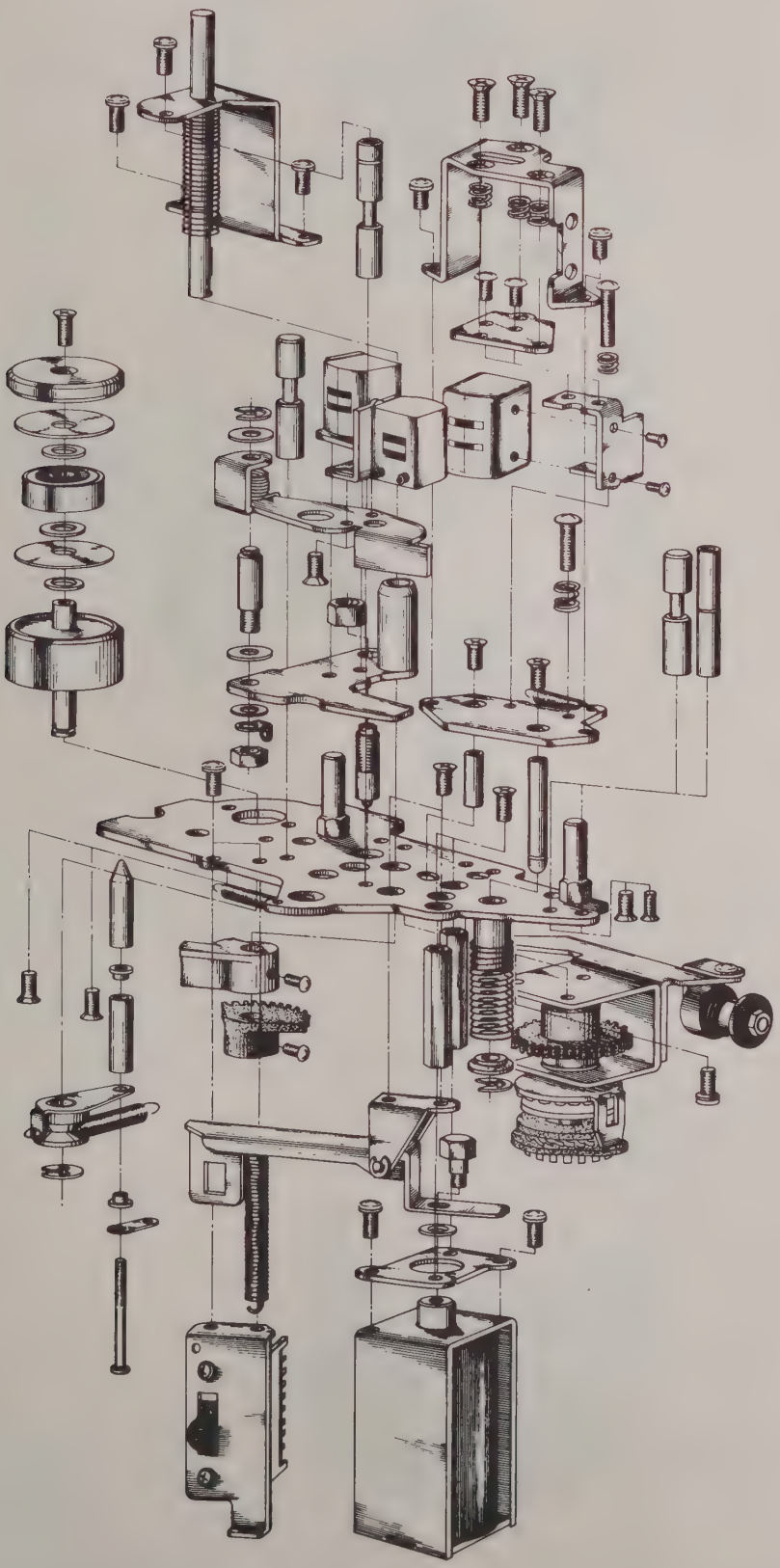


Fig. 6-1

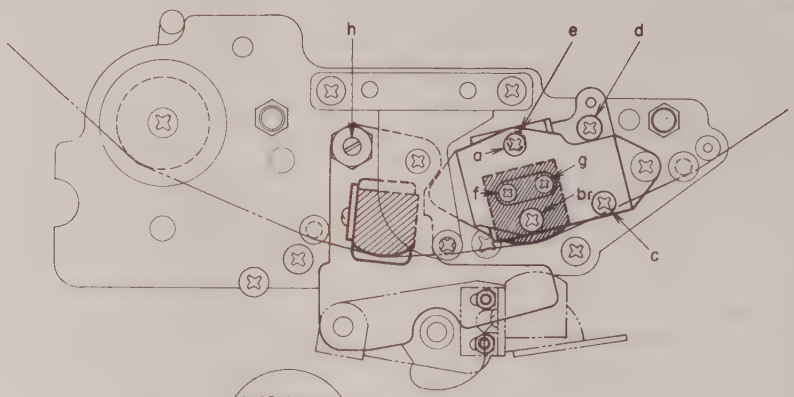


Fig. 6-2

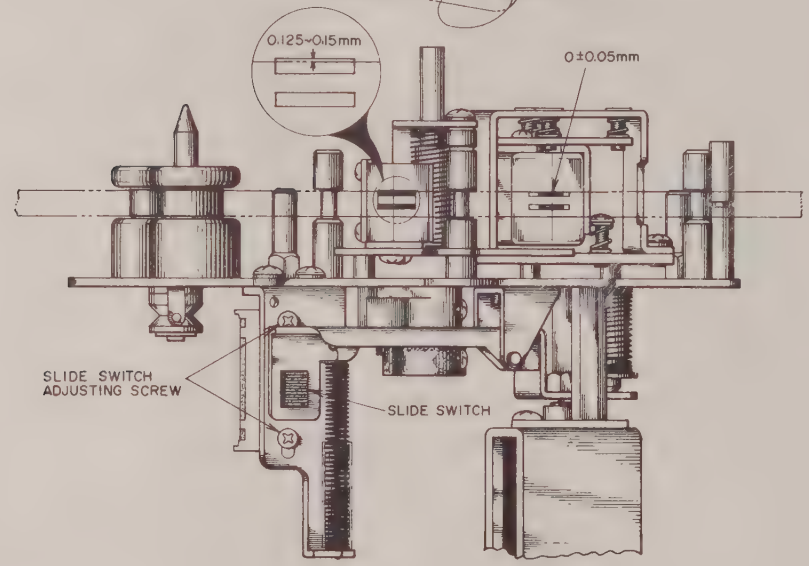


Fig. 6-3

1. ADJUSTMENT OF HEAD HEIGHT (SEE FIGURES 6-2 AND 3).

1) To adjust, turn screws (a) (b) (c) (Fig. 6-2).
During "Normal Play" position so that the upper edge of the upper core of the Playback/Rec Head is the same height as the upper edge of the tape.
Adjust by turning screw (d) (Fig. 6-2) during "Reverse Play" position so that the lower edge of the lower core of the Playback/Rec Head is the same height as the lower edge of the tape.

2) Erasing Head
Adjust screw (H) so that the upper edge of the upper core is 0.125 to 0.15 mm higher than the upper edge of the tape. In adjusting Head Height, make sure that the front of the Head is at right angles to the Chassis and that the upper and lower part of the Head firmly contacts the tape.

2. ADJUSTMENT OF AZIMUTH ALIGNMENT

1) Playback/Rec Head
Use a pre-recorded tape (16 kHz, 7-1/2 ips), and connect a high sensitivity V.T.V.M. to the line output jack. Adjust screws (c) (e) so that line output voltage is maximum.

2) Erasing Head
Visually check to assure that the center line of the Erasing Head is at right angles to the Head Chassis.

ILLUSTRATION OF REEL TABLE AND REEL MOTOR BLOCK

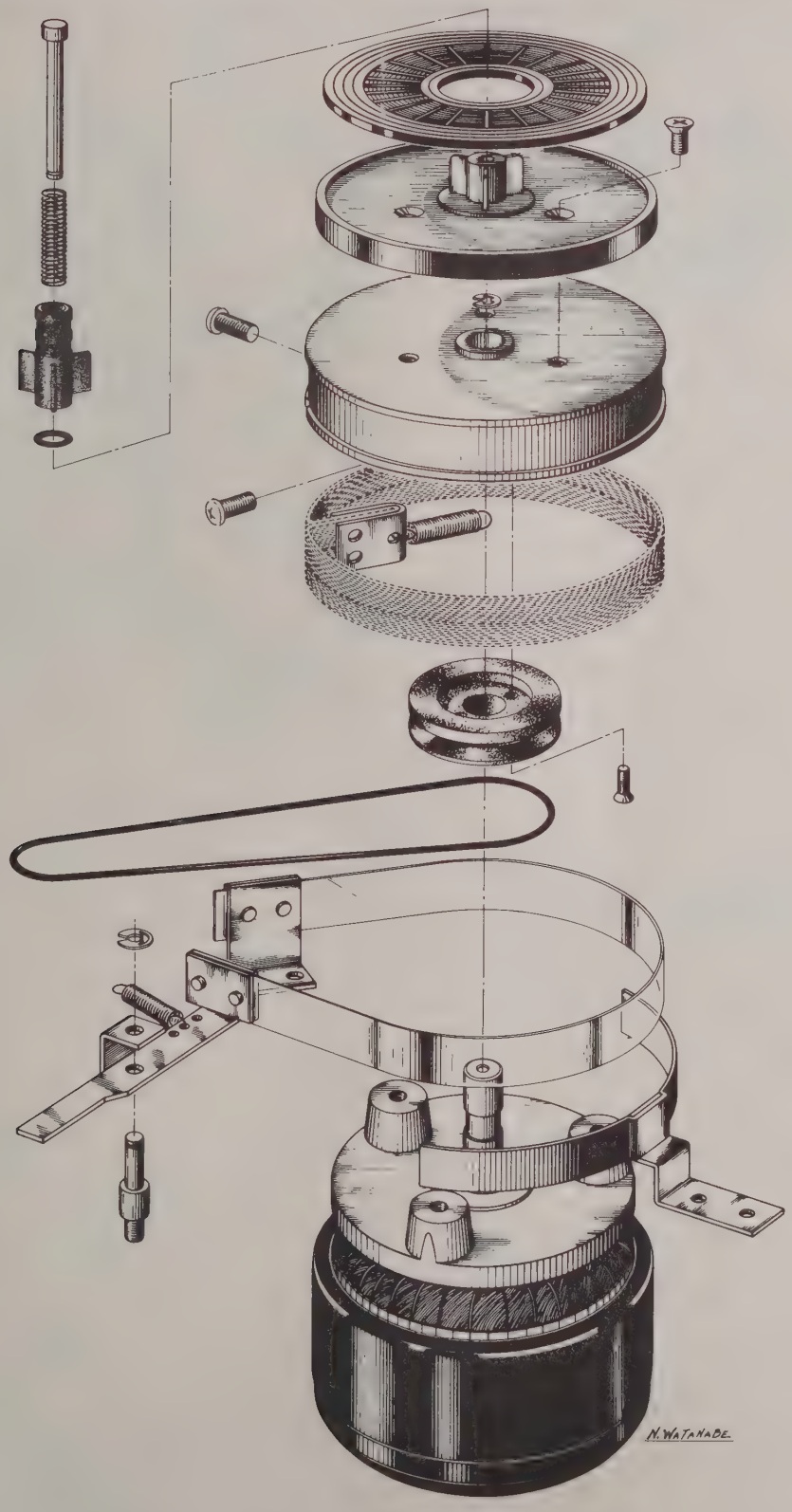


Fig. 6-4

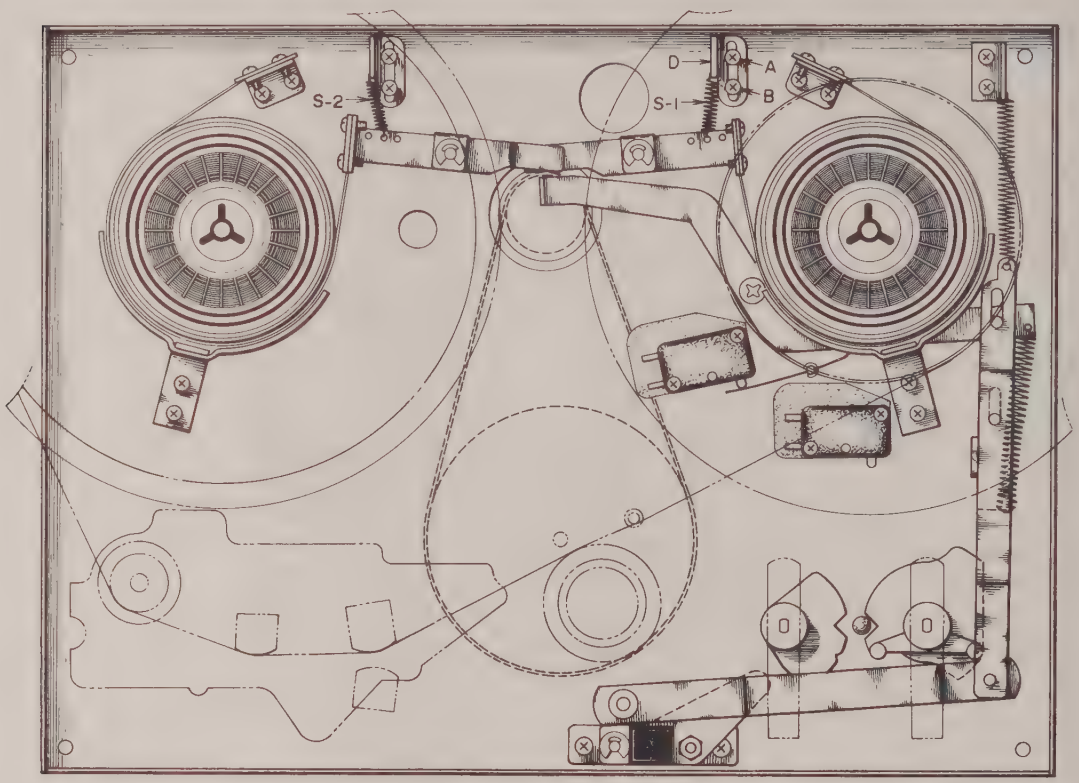


Fig. 6-5

BRAKE ADJUSTMENT

Using a Tension Gauge, and a 60 mm tape wound on a 5″ Reel, measuring can be done as per drawing. Measure the brake tension as shown in the drawing. 300 gr is standard.

To regulate tension, change the position of the suspended springs (S_1 and S_2 in Fig. 6-5) or loosen screws (A) (B) and regulate position of the spring suspension metal fitting (D).

REEL HEIGHT ADJUSTMENT (SEE DIAGRAM ILLUSTRATION)

Loosen Reel Table Screws and regulate height.

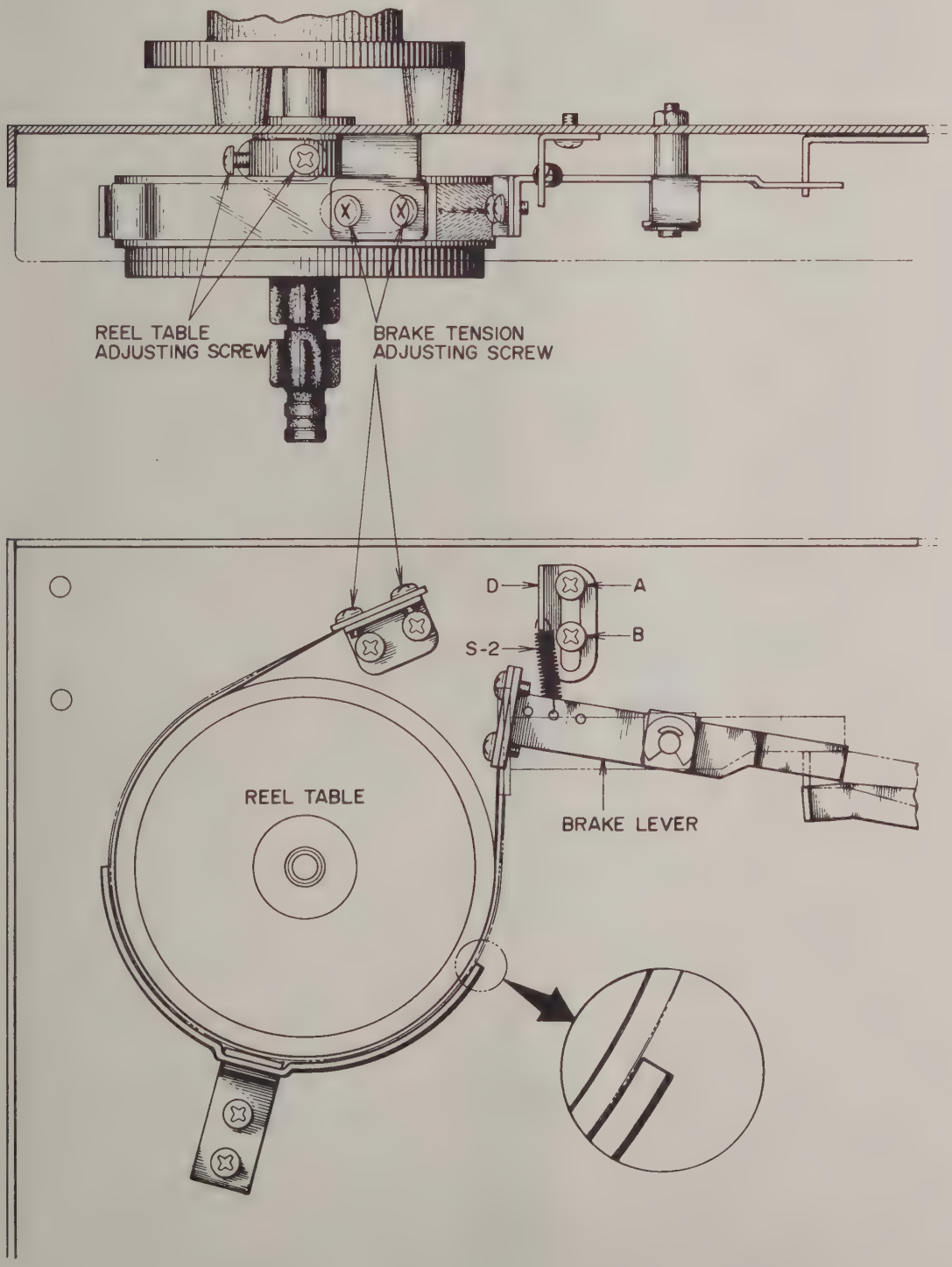


Fig. 6-6

ILLUSTRATION OF MAIN MOTOR BLOCK

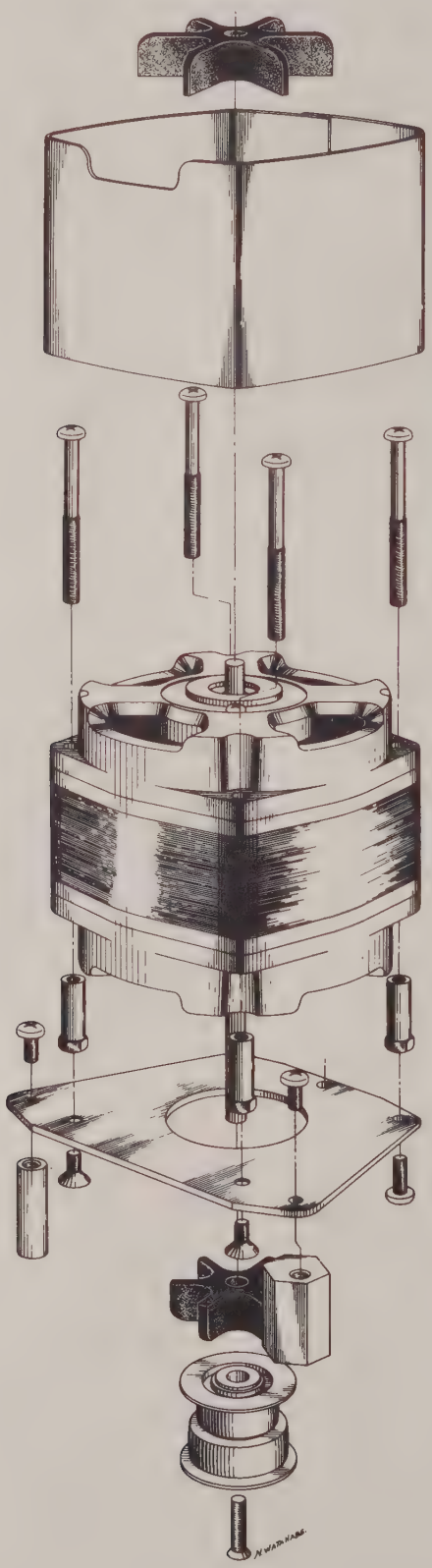


Fig. 6-7

ILLUSTRATION OF SWITCH LEVER BLOCK

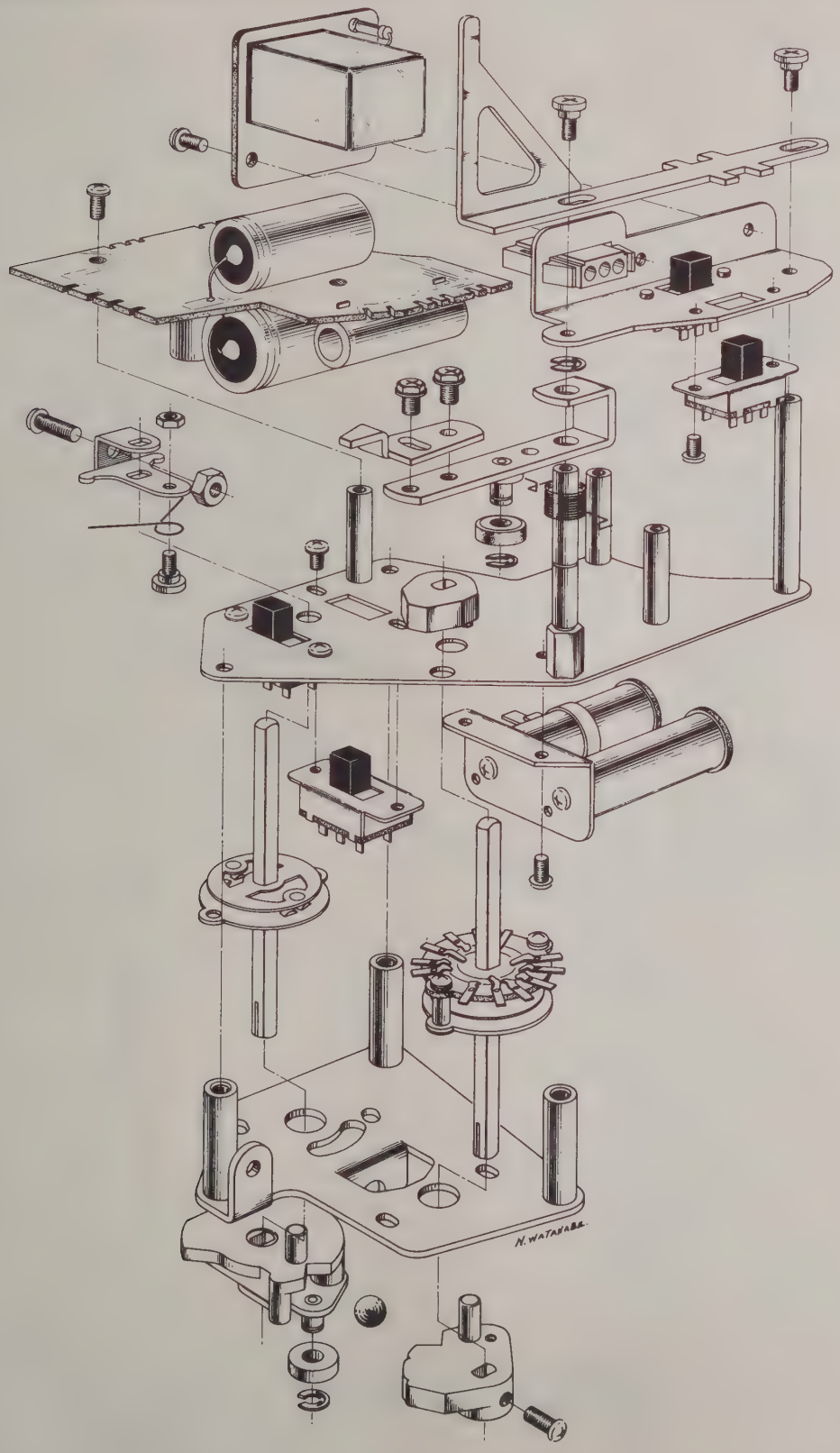


Fig. 6-8

ILLUSTRATION OF FLYWHEEL BLOCK

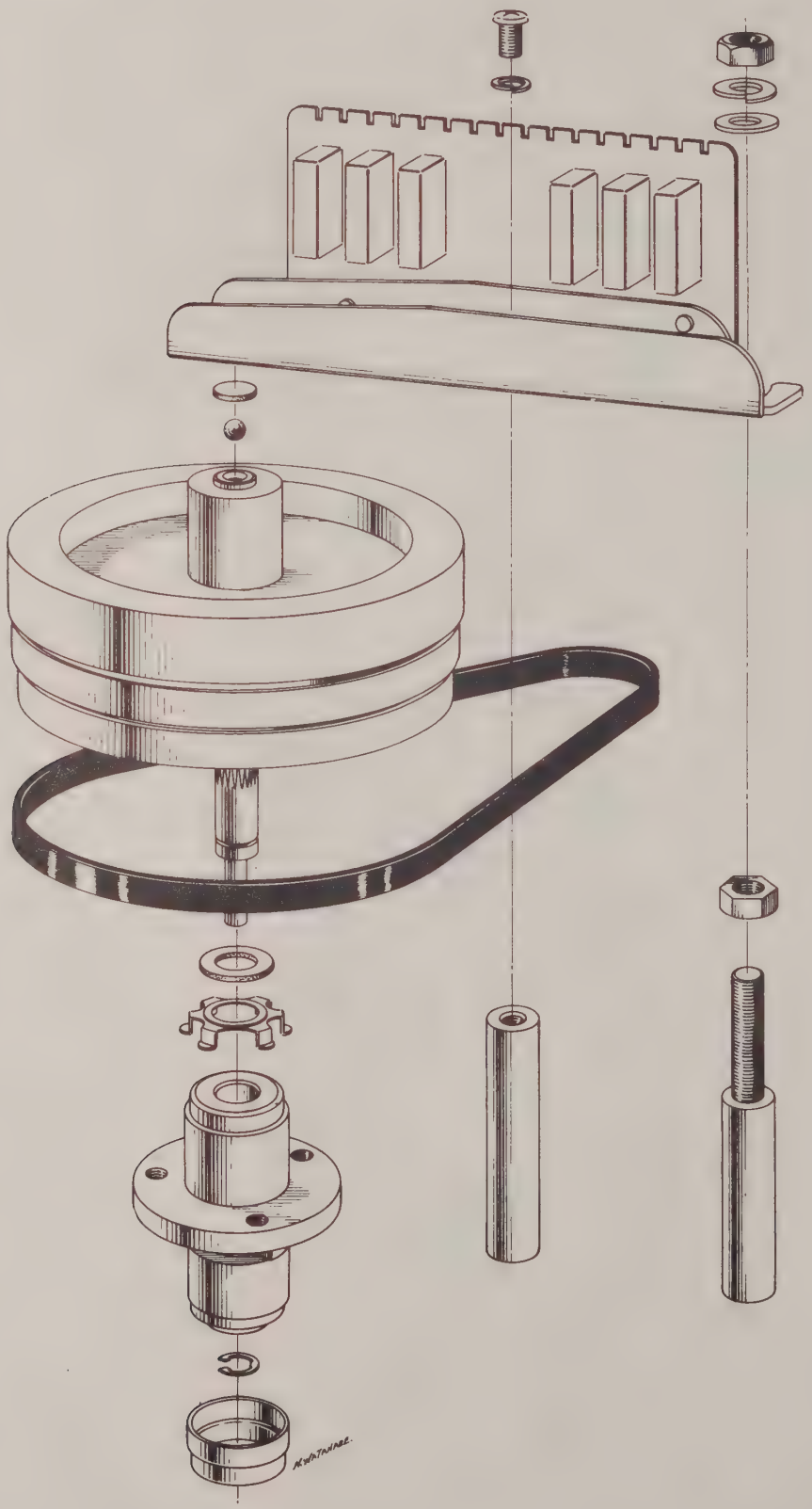


Fig. 6-9

VII. AMPLIFIER ADJUSTMENT

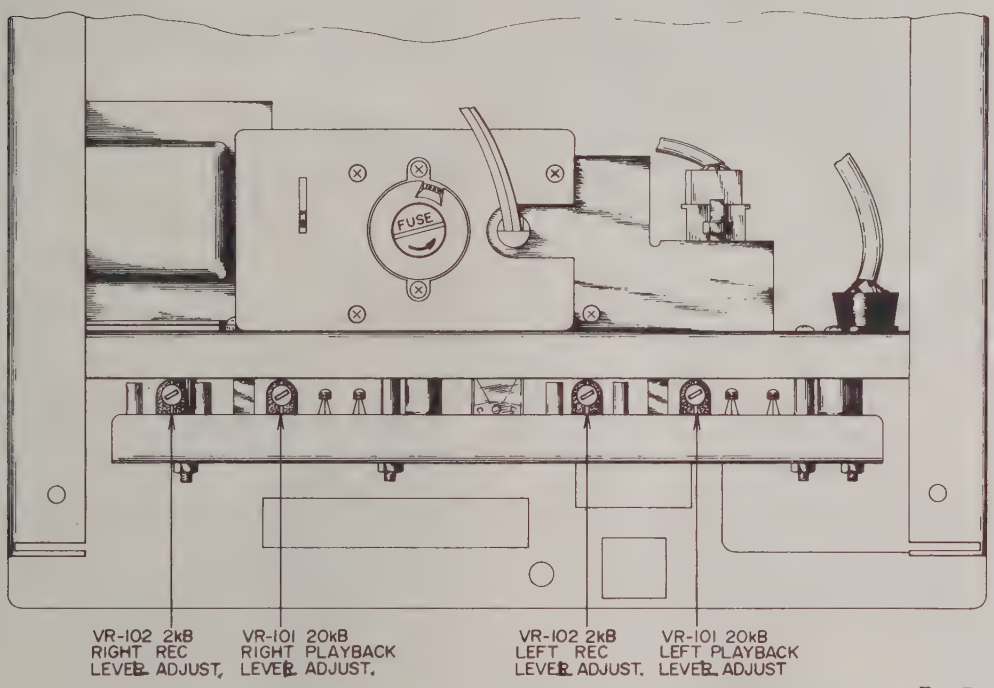


Fig. 7-1

1. PLAYBACK OUTPUT LEVEL (PRE-AMPLIFIER) ADJUSTMENT

a) Connect a high sensitivity V.T.V.M. to the Line Output Jack.
b) Set the Tape Speed Selector Switch to the "7-1/2" position.
c) Playback a 250 Hz pre-recorded tape.
d) Adjust the VR 101 (semi-fixed resistor 20 K-B, Fig. 7-1) of the pre-amplifier so that Line Output Voltage indicates 1.228 V (± 4 dbm).

2. ADJUSTMENT OF RECORDING LEVEL

Recording Amplifier Adjustment should be made only after Head Adjustment (vertical and horizontal azimuth) and Playback Amplifier Adjustments have been made.

1) As shown in Fig. 7-2, connect an Audio Oscillator and Attenuator to the Line Input. Connect a High-sensitivity V.T.V.M. to the Line Output.
2) Set Equalizer Switch and Tape Spped Selector to "7-1/2".
3) Load a blank test tape (Scotch No. 150) on the tape recorder and set the Rec/Playback Knob to "Rec" position.
4) Supply a 1000 Hz signal from the audio oscillator to the Line Input, and adjust the volume control so that the VU Meter indicates "0" VU (intermediate between red and black).
5) Record the tape and check playback to see whether the VU Meter indicates "0" VU.
6) If the pointer of the VU Meter fails to register "0" VU, repeat recording and playback by adjusting the semi-fixed resister VR 102 (2 KB) on the recording pre-amplifier until the "0" VU reading is obtained both on recording and playback.

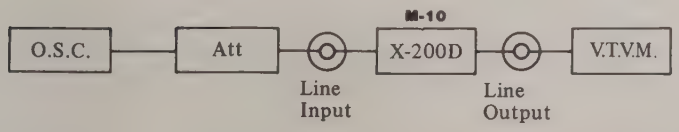


Fig. 7-2

3. ADJUSTMENT OF RECORDING BIAS FREQUENCY AND VOLTAGE

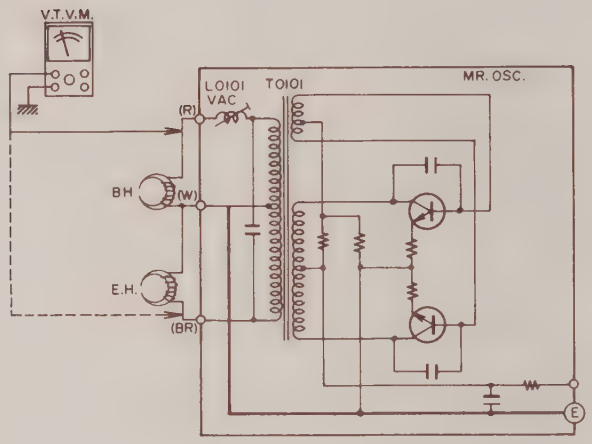


Fig. 7-3

Proper bias Frequency of the X-200D is 95 KC (±5 KC). The frequency can be adjusted by conveerting the value of the condenser (C.104 1000p) and L0101 (VAC).
Proper Bias Voltage is 105 V (±2 V). The voltage can be adjusted by turning the V.A.C. (L0101) in the bias oscillator circuit.

Erasing Voltage is 90 V (±5 db).

4. ADJUSTMENT OF D.C. BIAS CURRENT OF POWER OUTPUT TRAUSISTORS WITH NO INPUT SINGNAL (SEE FIG, 7-4)

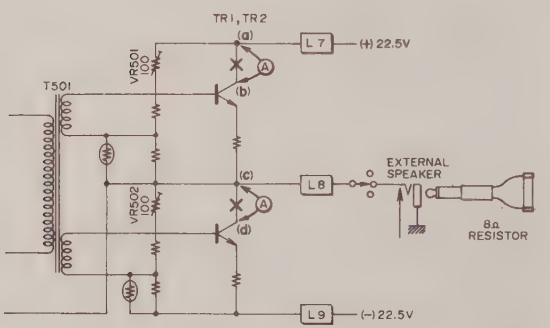


Fig. 7-4

1) Disconnect collector wire of Transistor TR1 and TR2
2) Connect the Ampere Meter (maximum scale 250 mA) to the collector circuit (a)and (b), (c) and(d)
3) Connect the 8 Ω resistor to the External speaker Jack
4) Turn the Volume control back to the minimum position
5) Adjust the potentiometer VR501 and VR502 (100 Ω) until the Collector Current reahes 35 ~ 40 mA

Caution : It is important that the potentiometer be adjusted so that both meters indicate equal levels.

5. ADJUSTMENT OF THE LEVEL CONTROL VR601

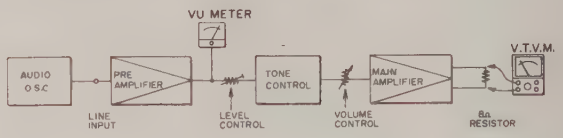


Fig. 7-5

1) Connect Audio Oscillator to the Line input and supply 1000 Hz sine wave
2) Set Record Level control so that the VU meter indicate "O" VU
3) Connect 8 ohms (10 W) resistor to the External speaker Jack
4) Connect V.T.V.M. across 8 ohms resistor
5) Turn the Volume Control up to the maximum position
6) adjust Level Control potentiometer so that Output Voltage reaches 8 volts.

VIII. MAINTENANCE PROCEDURES

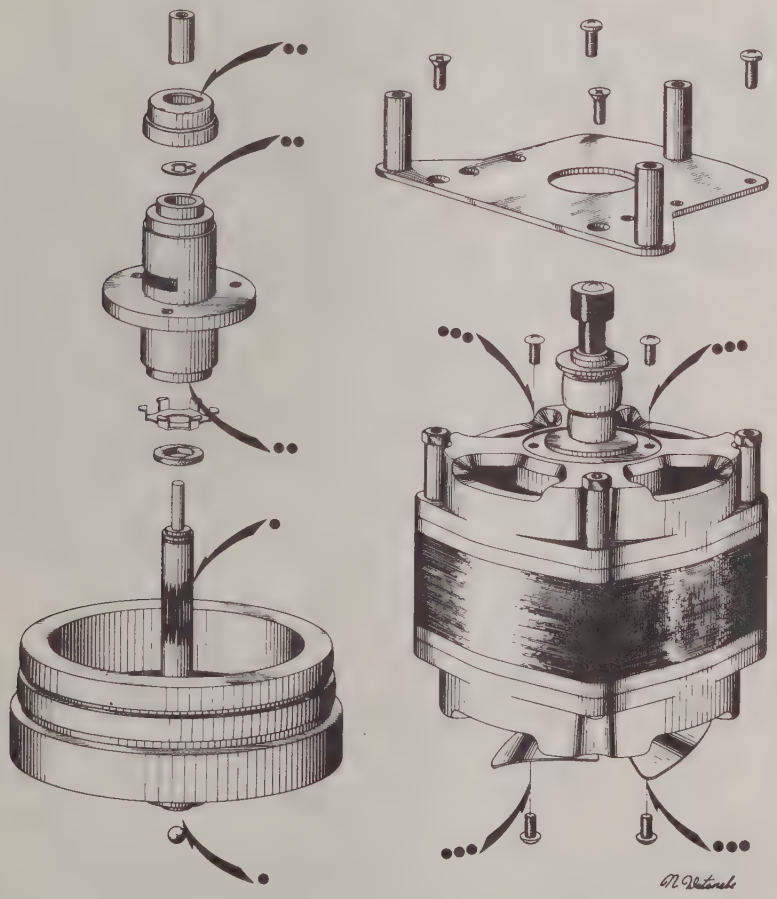
1. LUBRICATION INSTRUCTION

For maximum service life and optimum performance, lubricate the parts identified below after each 500 hours of operation. Use only light machine oil of good quality.

Motor
Flywheel Assembly
Pinch Wheel . . . . . 1 drop

Also apply a liberal film of light machine grease to each roller surface of all levers and cams.

CAUTION : DO NOT OVER-LUBRICATE, AND WIPE OFF EXCESS OIL BY A COTTON SWAB SOAKED IN ALCOHOL. OTHERWISE, THE EXCESS LUBRICANT MAY BE SCATTERED DURING OPERATION. AND THE RUBBER COMPONENT PARTS WILL DETERIORATE.

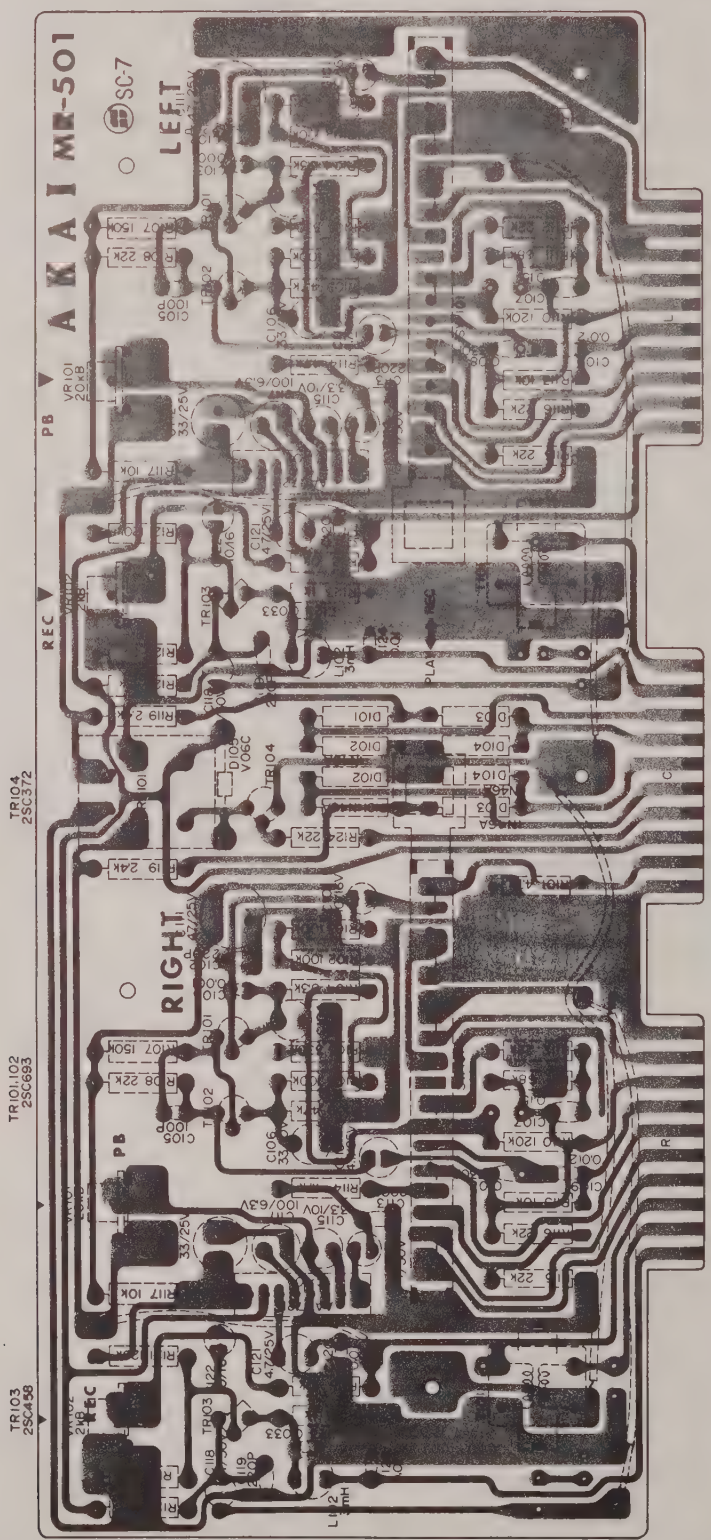


FLYWEEL ● 1 drop MOTOR

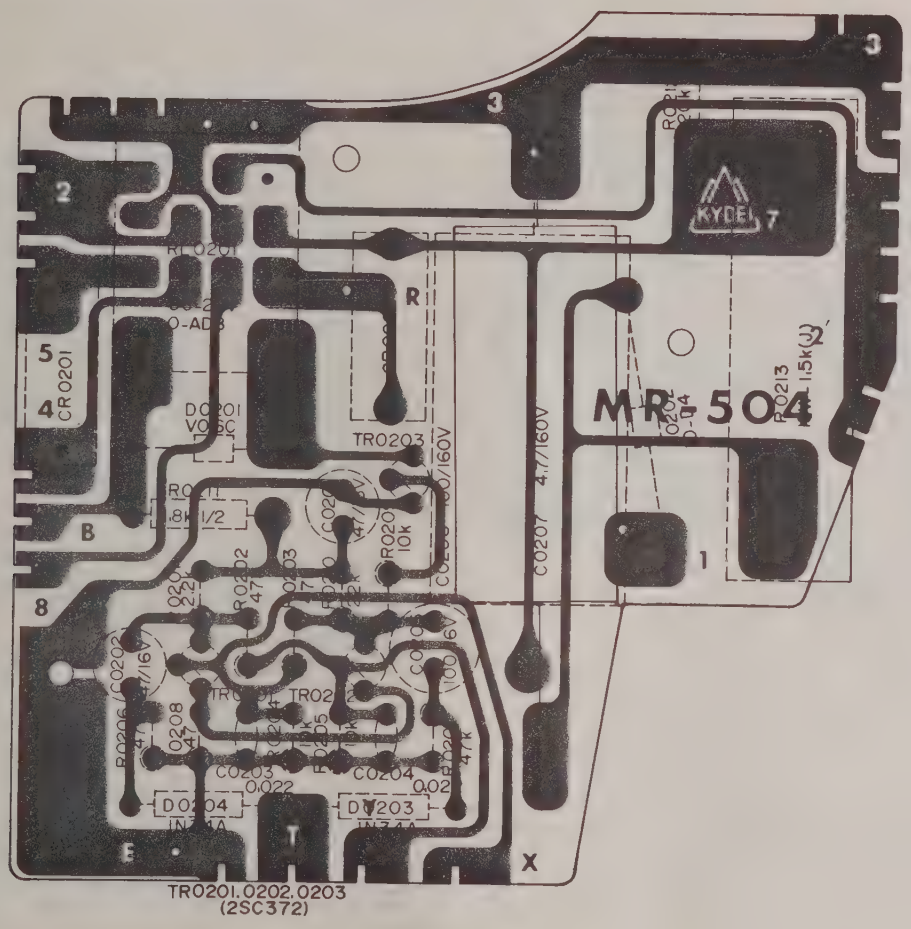
2. CLEANING TAPE HEADS AND OTHER PARTS

Wipe surface of tape heads, guide roller bearing, capstan busing and pinch wheel periodically with a soft cloth soaked in alcohol or carbon-tet.

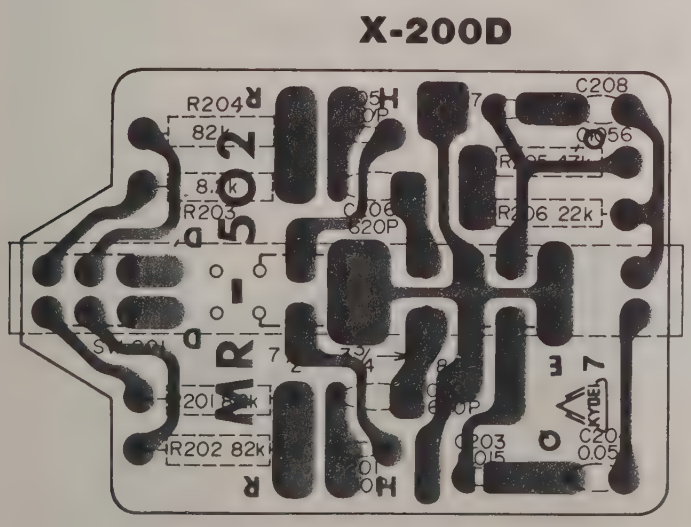
PRE. AMP PRINTED CARD (MR-501)



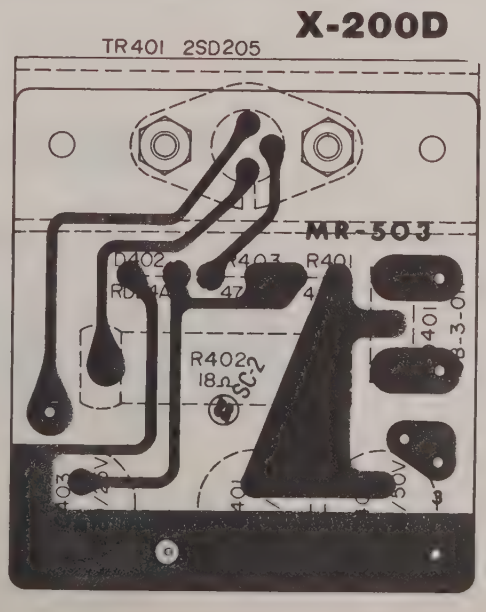
SYSTEM CONTROL PRINTED CARD (MR-504)



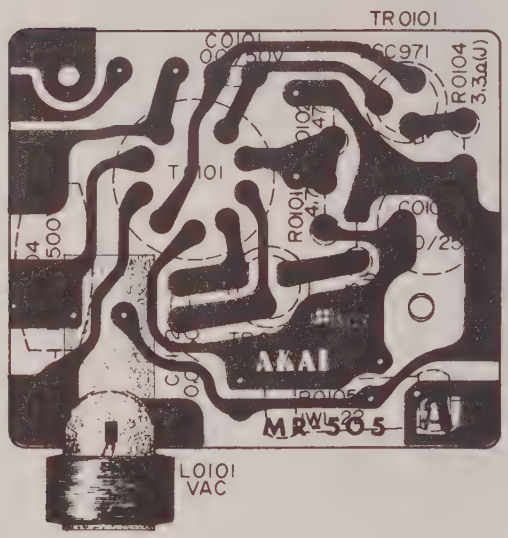
EQURIZER PRINTED CARD (MR-502)



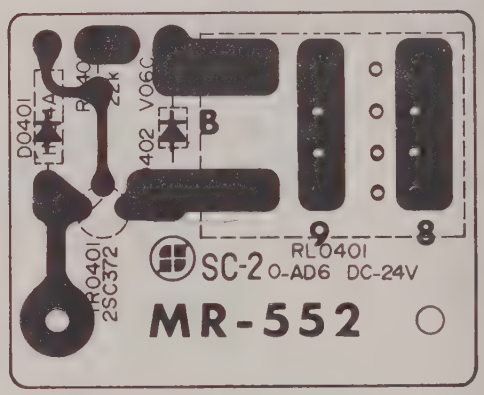
POWER SOURCE PRINTED CARD (MR-503)



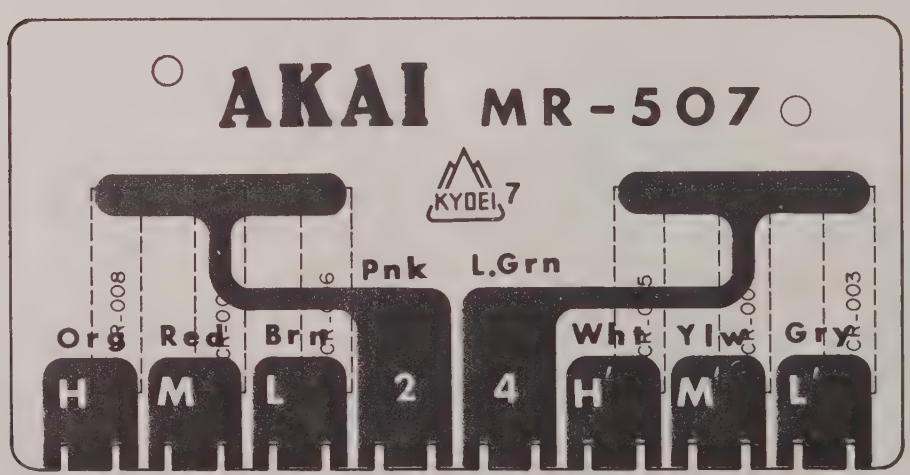
O.S.C. PRINTED CARD (MR-505)



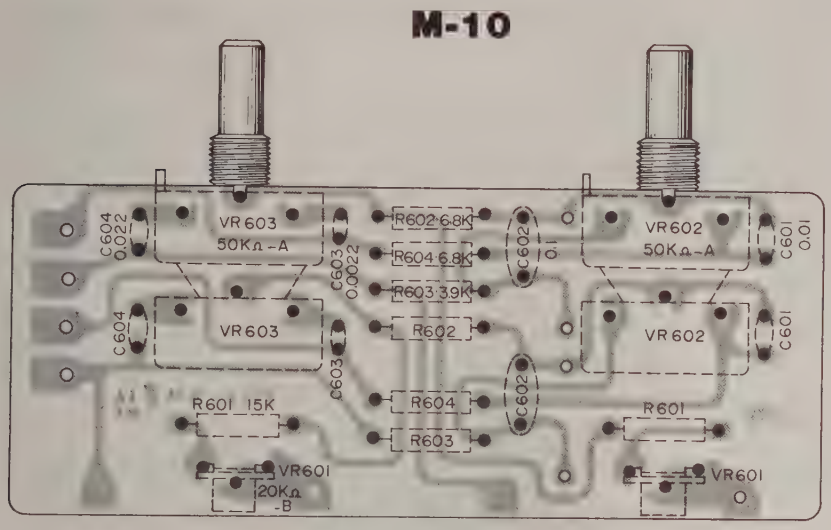
TENSION RELAY PRINTED CARD (MR-552)



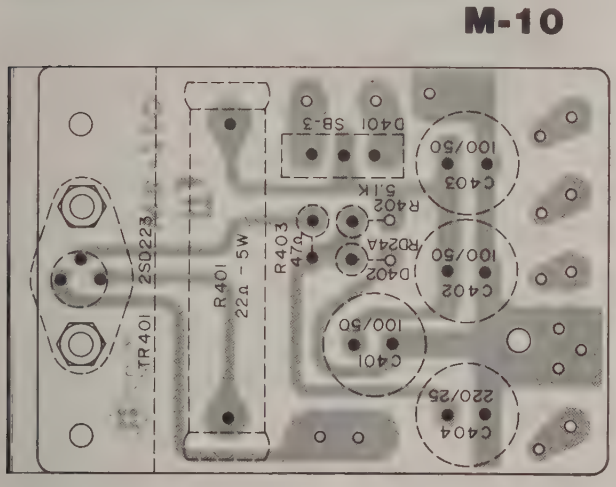
SPARK QUENCHER PRINTED CARD (MR-507)

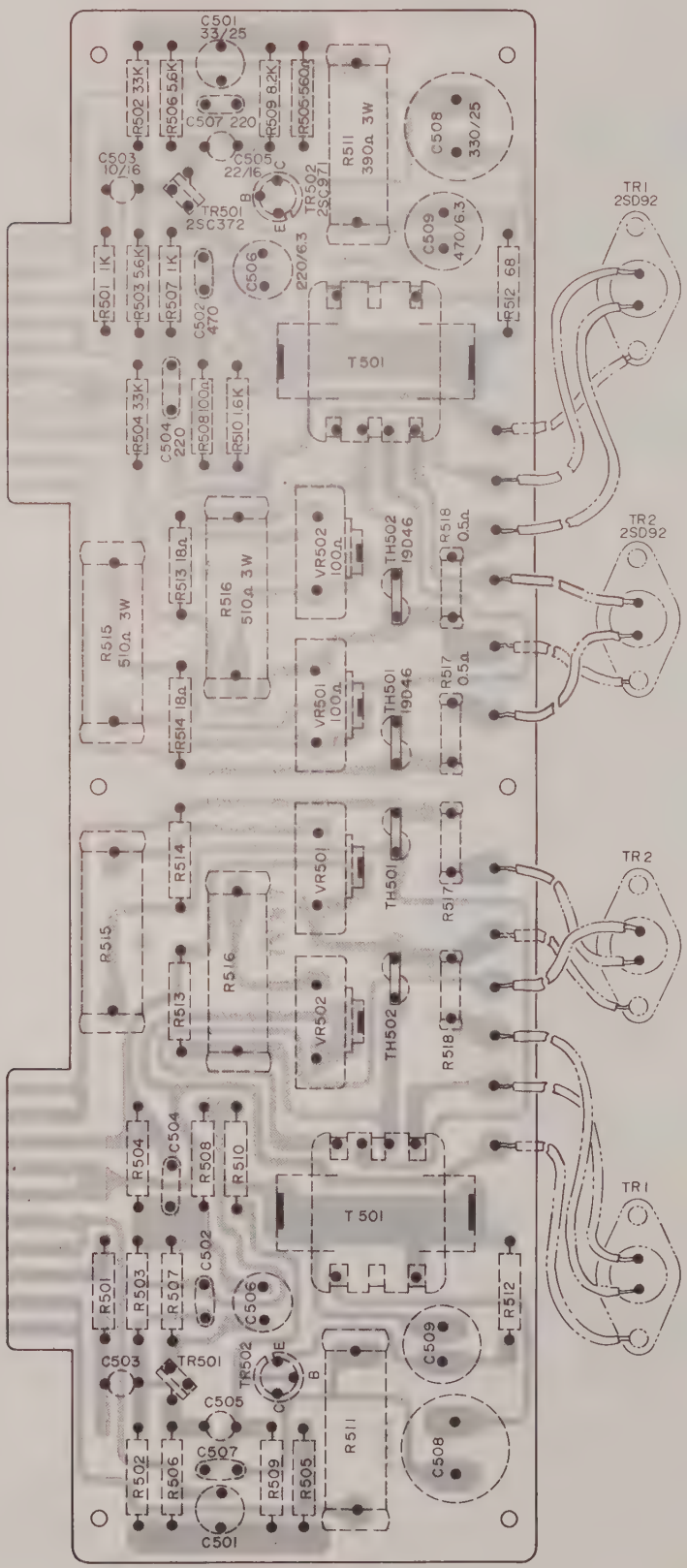


TONE CONTROL PRINTED CARD (MRA-509)



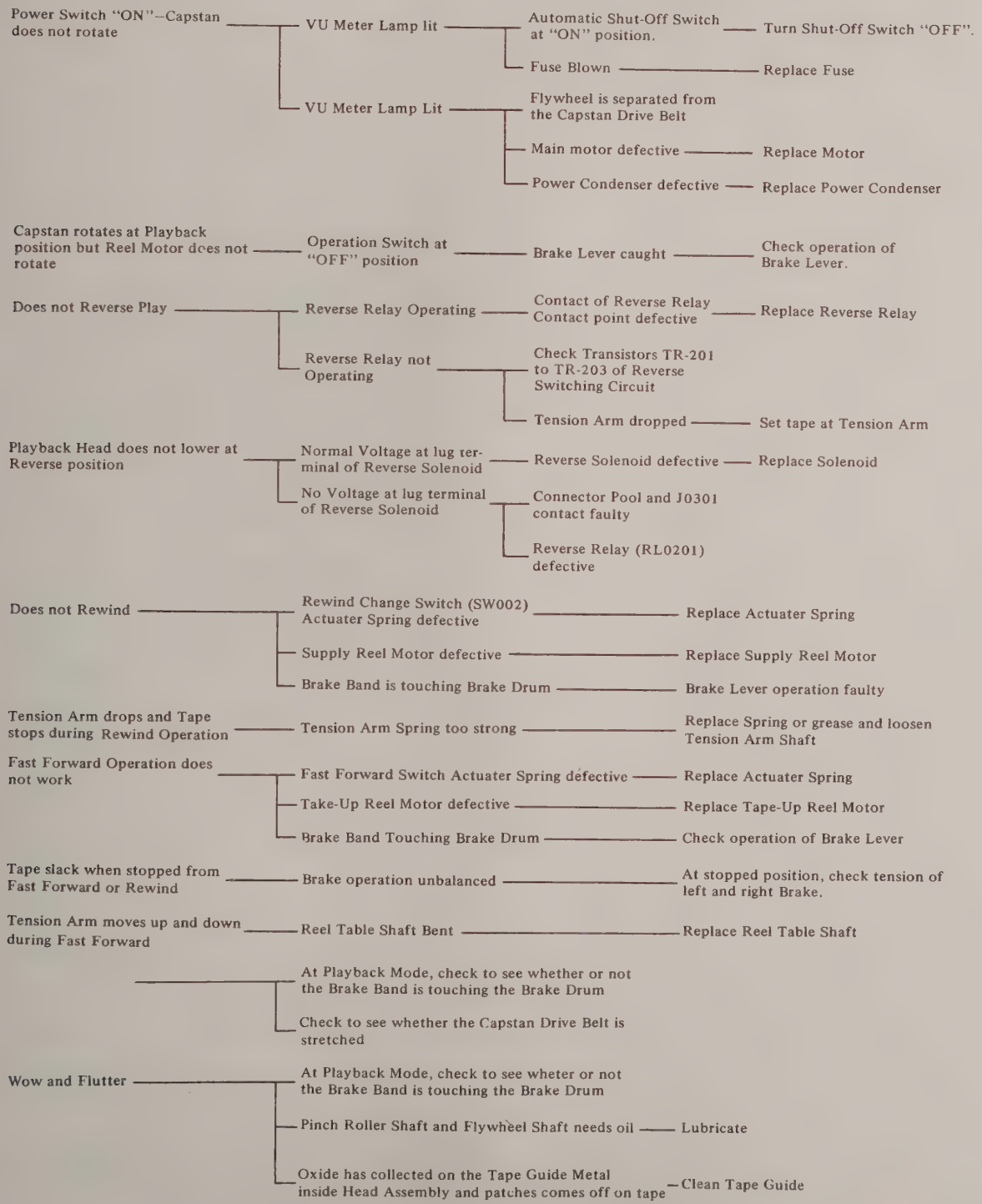
POWER SOURCE PRINTED CARD (MRA-510)




C501 33/25
C507 220
C505 22/16
C503 10/16
R502 33K
R506 5.6K
R509 8.2K
R505 560Ω
R511 390Ω 3W
C508 330/25
C509 470/6.3
TR501 2SC372
TR502 2SC971
C506 220/6.3
R501 1K
R503 5.6K
R507 1K
C502 470
R512 68
TR1 2SD92
T501
R504 33K
C504 220
R508 100Ω
R510 1.6K
TR2 2SD92
R515 510Ω 3W
R513 18Ω
R516 510Ω 3W
VR502 100Ω
TH502 19046
R518 0.5Ω
R514 18Ω
VR501 100Ω
TH501 19046
R517 0.5Ω
TR2
TR1
T 501
C501
C503
C505
C507
C509
C508
R511
R512
TR501
TR502

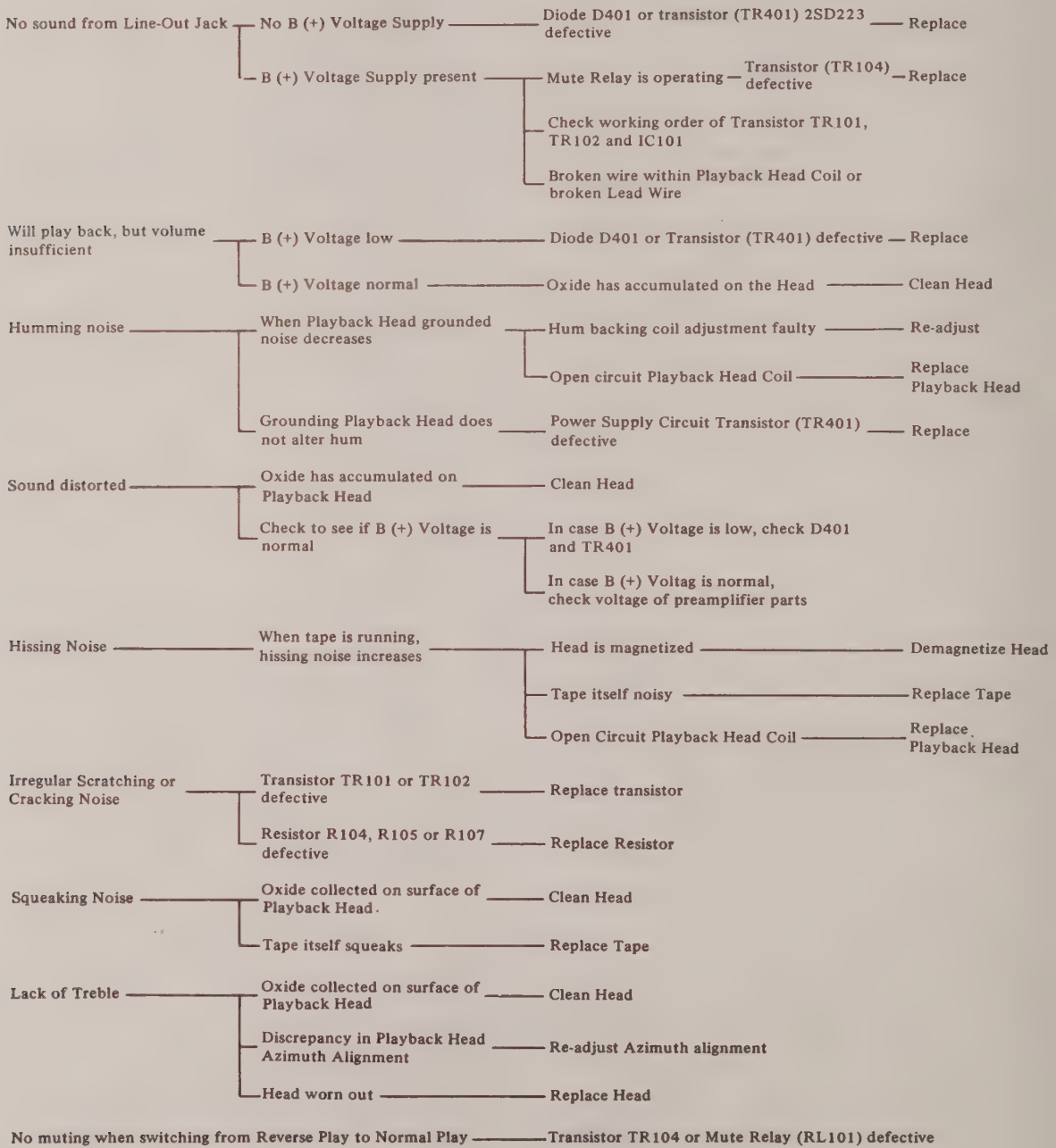
X. TROUBLE SHOOTING CHART

SECTION "A" TROUBLES WITH TAPE TRANSPORT MECHANISM

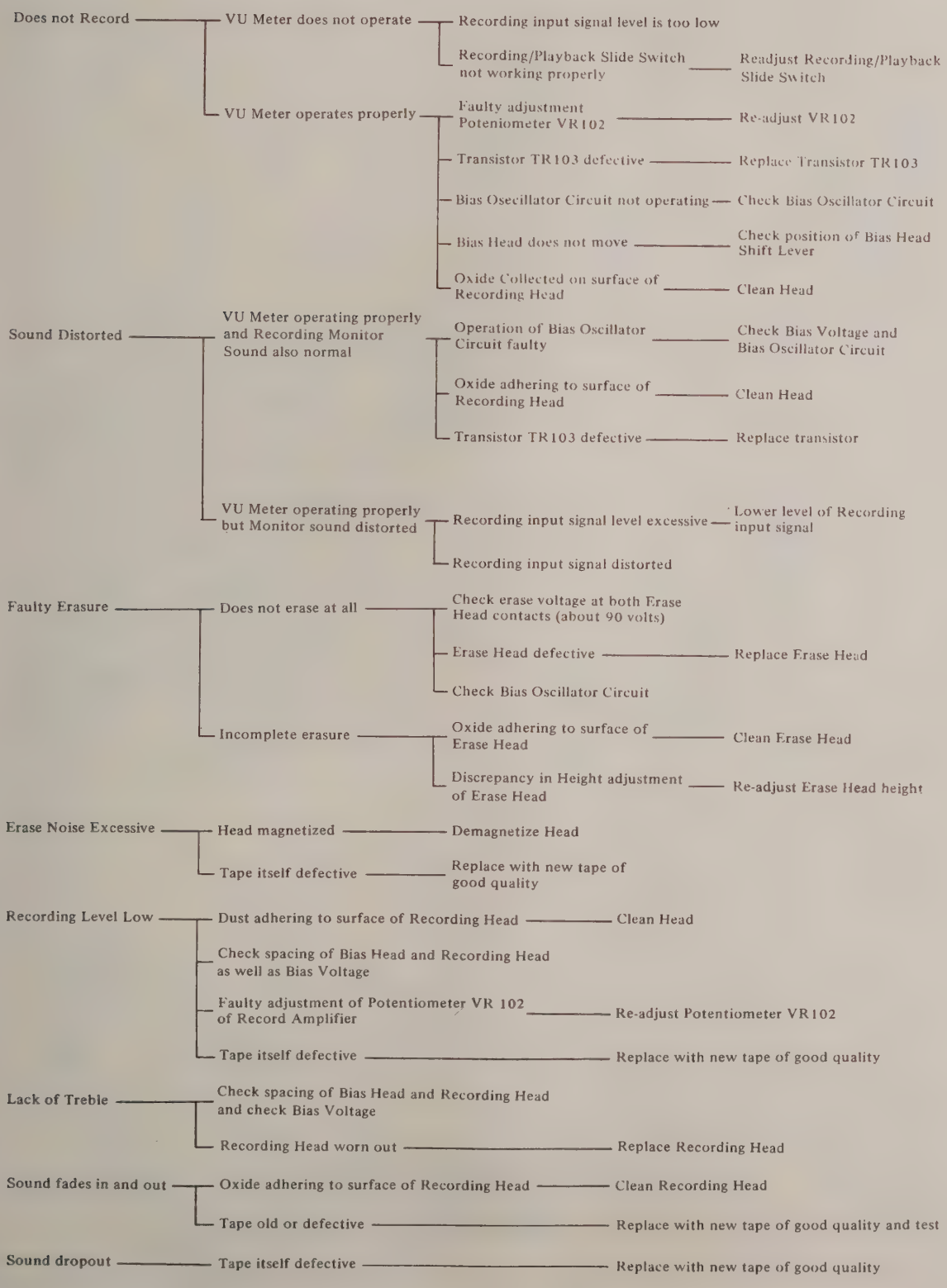

Power Switch "ON"—Capstan does not rotate
VU Meter Lamp lit
Automatic Shut-Off Switch at "ON" position.
Turn Shut-Off Switch "OFF".
Fuse Blown
Replace Fuse
VU Meter Lamp Lit
Flywheel is separated from the Capstan Drive Belt
Main motor defective
Replace Motor
Power Condenser defective
Replace Power Condenser
Capstan rotates at Playback position but Reel Motor does not rotate
Operation Switch at "OFF" position
Brake Lever caught
Check operation of Brake Lever.
Does not Reverse Play
Reverse Relay Operating
Contact of Reverse Relay Contact point defective
Replace Reverse Relay
Reverse Relay not Operating
Check Transistors TR-201 to TR-203 of Reverse Switching Circuit
Tension Arm dropped
Set tape at Tension Arm
Playback Head does not lower at Reverse position
Normal Voltage at lug terminal of Reverse Solenoid
Reverse Solenoid defective
Replace Solenoid
No Voltage at lug terminal of Reverse Solenoid
Connector Pool and J0301 contact faulty
Reverse Relay (RL0201) defective
Does not Rewind
Rewind Change Switch (SW002) Actuater Spring defective
Replace Actuater Spring
Supply Reel Motor defective
Replace Supply Reel Motor
Brake Band is touching Brake Drum
Brake Lever operation faulty
Tension Arm drops and Tape stops during Rewind Operation
Tension Arm Spring too strong
Replace Spring or grease and loosen Tension Arm Shaft
Fast Forward Operation does not work
Fast Forward Switch Actuater Spring defective
Replace Actuater Spring
Take-Up Reel Motor defective
Replace Tape-Up Reel Motor
Brake Band Touching Brake Drum
Check operation of Brake Lever
Tape slack when stopped from Fast Forward or Rewind
Brake operation unbalanced
At stopped position, check tension of left and right Brake.
Tension Arm moves up and down during Fast Forward
Reel Table Shaft Bent
Replace Reel Table Shaft
At Playback Mode, check to see whether or not the Brake Band is touching the Brake Drum
Check to see whether the Capstan Drive Belt is stretched
Wow and Flutter
At Playback Mode, check to see wheter or not the Brake Band is touching the Brake Drum
Pinch Roller Shaft and Flywheel Shaft needs oil
Lubricate
Oxide has collected on the Tape Guide Metal inside Head Assembly and patches comes off on tape
Clean Tape Guide

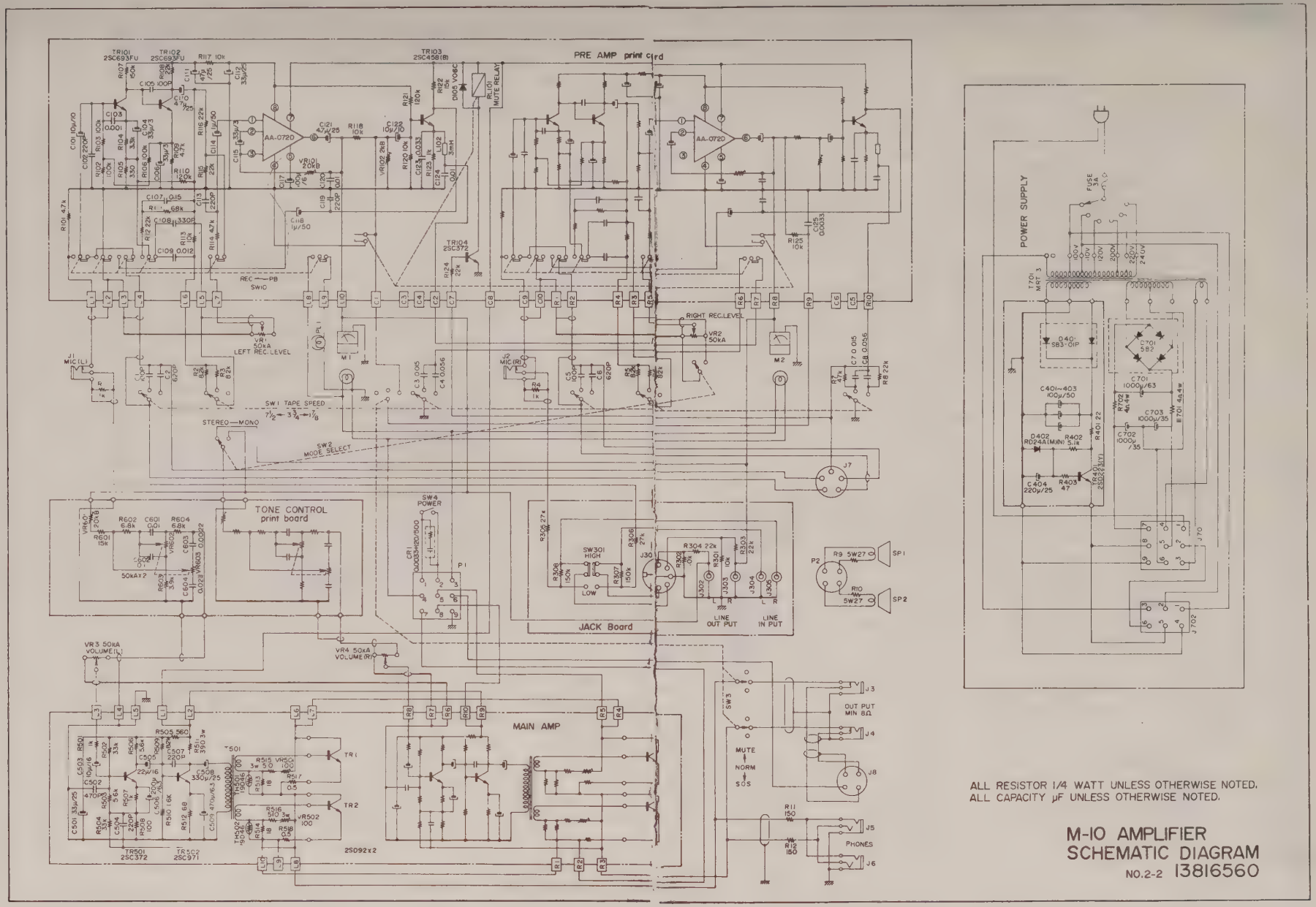
SECTION "B" TROUBLES WITH AMPLIFIER

1. Playback Mode


No sound from Line-Out Jack
No B (+) Voltage Supply
Diode D401 or transistor (TR401) 2SD223 defective
Replace
B (+) Voltage Supply present
Mute Relay is operating
Transistor (TR104) defective
Replace
Check working order of Transistor TR101, TR102 and IC101
Broken wire within Playback Head Coil or broken Lead Wire
Will play back, but volume insufficient
B (+) Voltage low
Diode D401 or Transistor (TR401) defective
Replace
B (+) Voltage normal
Oxide has accumulated on the Head
Clean Head
Humming noise
When Playback Head grounded noise decreases
Hum backing coil adjustment faulty
Re-adjust
Open circuit Playback Head Coil
Replace Playback Head
Grounding Playback Head does not alter hum
Power Supply Circuit Transistor (TR401) defective
Replace
Sound distorted
Oxide has accumulated on Playback Head
Clean Head
Check to see if B (+) Voltage is normal
In case B (+) Voltage is low, check D401 and TR401
In case B (+) Voltag is normal, check voltage of preamplifier parts
Hissing Noise
When tape is running, hissing noise increases
Head is magnetized
Demagnetize Head
Tape itself noisy
Replace Tape
Open Circuit Playback Head Coil
Replace Playback Head
Irregular Scratching or Cracking Noise
Transistor TR101 or TR102 defective
Replace transistor
Resistor R104, R105 or R107 defective
Replace Resistor
Squeaking Noise
Oxide collected on surface of Playback Head.
Clean Head
Tape itself squeaks
Replace Tape
Lack of Treble
Oxide collected on surface of Playback Head
Clean Head
Discrepancy in Playback Head Azimuth Alignment
Re-adjust Azimuth alignment
Head worn out
Replace Head
No muting when switching from Reverse Play to Normal Play
Transistor TR104 or Mute Relay (RL101) defective

2. Recording Mode

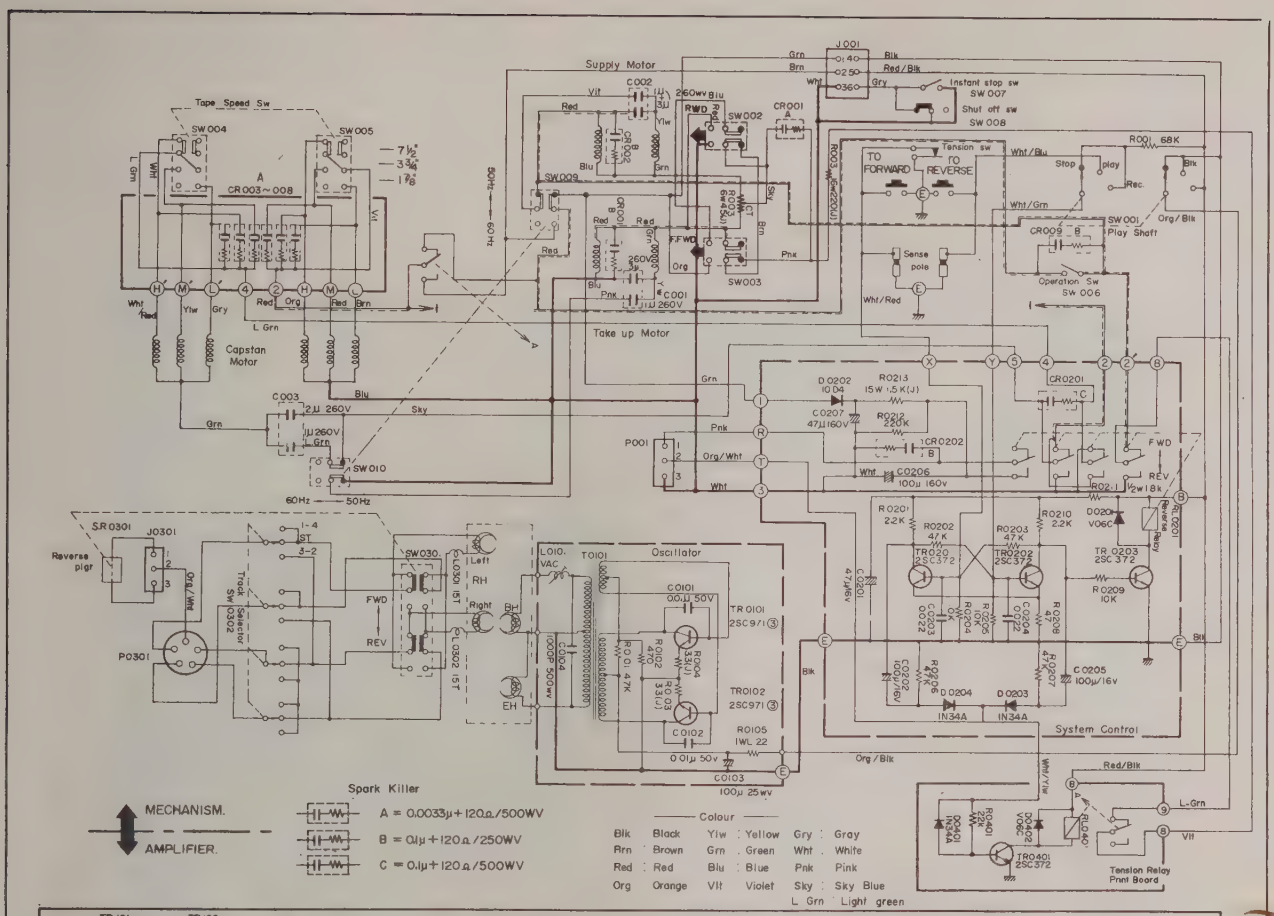

Does not Record
VU Meter does not operate
Recording input signal level is too low
Recording/Playback Slide Switch not working properly
Readjust Recording/Playback Slide Switch
VU Meter operates properly
Faulty adjustment Poteniometer VR102
Re-adjust VR102
Transistor TR103 defective
Replace Transistor TR103
Bias Osecillator Circuit not operating
Check Bias Oscillator Circuit
Bias Head does not move
Check position of Bias Head Shift Lever
Oxide Collected on surface of Recording Head
Clean Head
Sound Distorted
VU Meter operating properly and Recording Monitor Sound also normal
Operation of Bias Oscillator Circuit faulty
Check Bias Voltage and Bias Oscillator Circuit
Oxide adhering to surface of Recording Head
Clean Head
Transistor TR103 defective
Replace transistor
VU Meter operating properly but Monitor sound distorted
Recording input signal level excessive
Lower level of Recording input signal
Recording input signal distorted
Faulty Erasure
Does not erase at all
Check erase voltage at both Erase Head contacts (about 90 volts)
Erase Head defective
Replace Erase Head
Check Bias Oscillator Circuit
Incomplete erasure
Oxide adhering to surface of Erase Head
Clean Erase Head
Discrepancy in Height adjustment of Erase Head
Re-adjust Erase Head height
Erase Noise Excessive
Head magnetized
Demagnetize Head
Tape itself defective
Replace with new tape of good quality
Recording Level Low
Dust adhering to surface of Recording Head
Clean Head
Check spacing of Bias Head and Recording Head as well as Bias Voltage
Faulty adjustment of Potentiometer VR 102 of Record Amplifier
Re-adjust Potentiometer VR102
Tape itself defective
Replace with new tape of good quality
Lack of Treble
Check spacing of Bias Head and Recording Head and check Bias Voltage
Recording Head worn out
Replace Recording Head
Sound fades in and out
Oxide adhering to surface of Recording Head
Clean Recording Head
Tape old or defective
Replace with new tape of good quality and test
Sound dropout
Tape itself defective
Replace with new tape of good quality

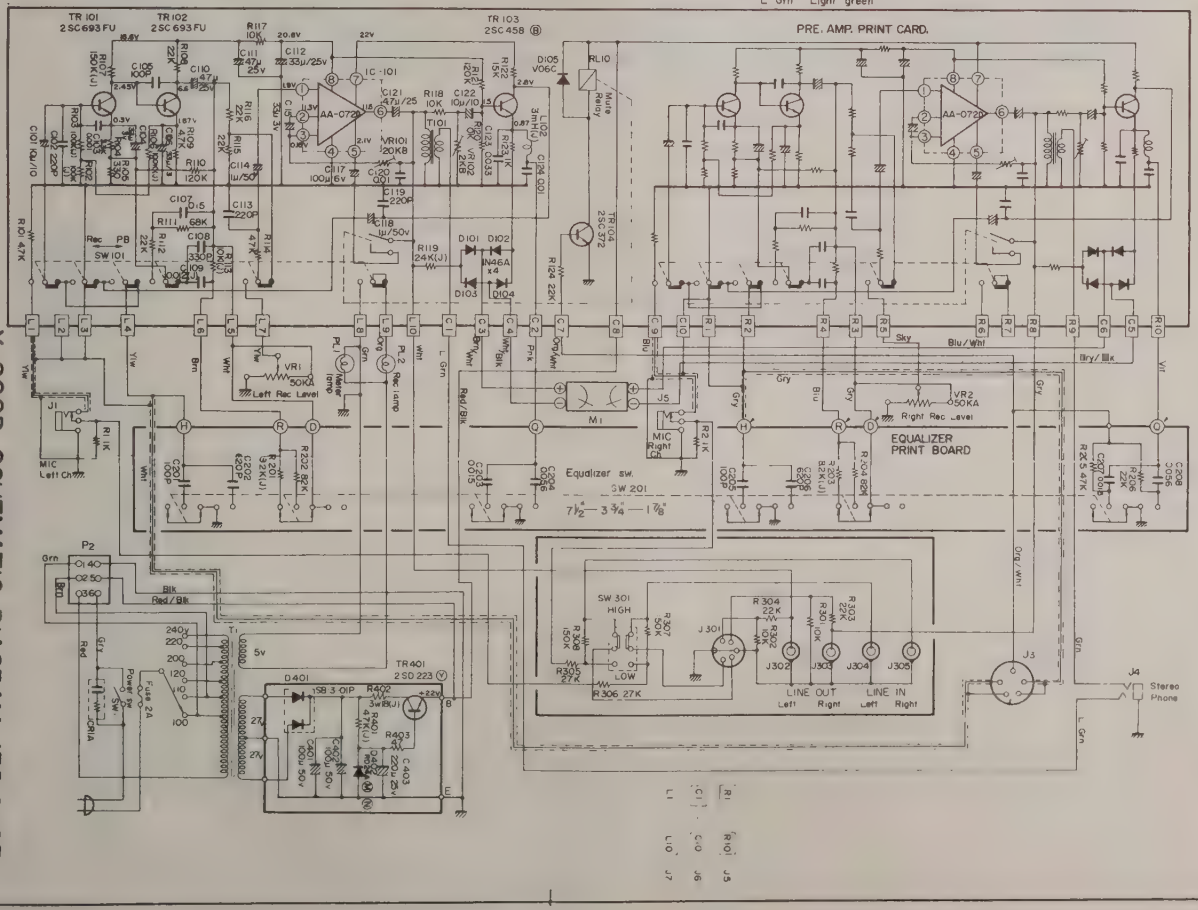


ALL RESISTOR 1/4 WATT UNLESS OTHERWISE NOTED.
ALL CAPACITY μF UNLESS OTHERWISE NOTED.

M-10 AMPLIFIER SCHEMATIC DIAGRAM

NO.2-2 13816560



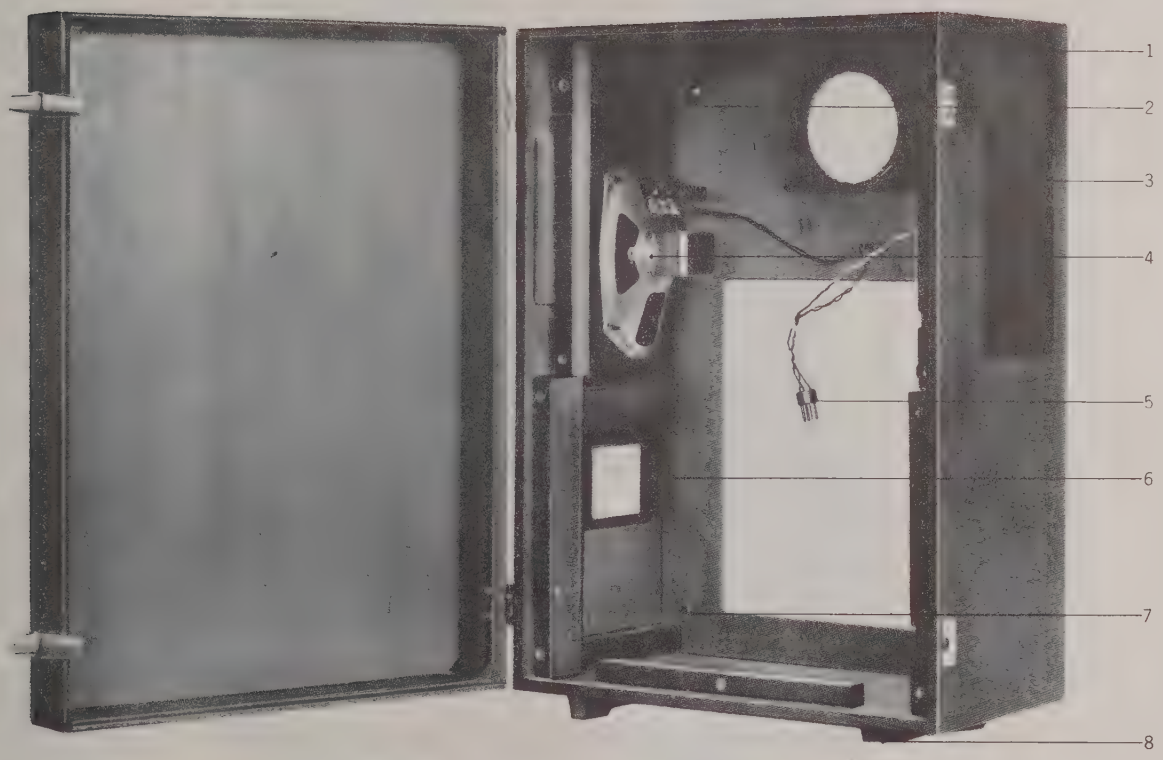


X-200D SCHEMATIC DIAGRAM 13812483

X-200D M-10

CASE BLOCK 1
FRONT PANEL BLOCK 2
PARTS LIST FOR MECHANISM BLOCK .....
MRD X-FIELD HEAD BLOCK 7
REEL TABLE AND REEL MOTOR BLOCK 8
MAIN MOTOR BLOCK 10
FLYWHEEL BLOCK 12
SWITCH LEVER BLOCK 14
MECHANISM ASSEMBLY BLOCK 16
PARTS LIST FOR AMPLIFIER BLOCK 17
PRE-AMP. PRINTED CARD BLOCK (MRA-501) 18
SYSTEM CONTROL PRINTED CARD BLOCK (MR-504) 21
OSC. PRINTED CARD BLOCK (MR-505) 22
SPARD QUENCHER PRINTED CARD BLOCK (MR-507) 25
MAIN AMPLIFIER PRINTED CARD BLOCK (MRA-508) 23
TONE CONTROL PRINTED CARD BLOCK (MRA-509) 22
POWER SOURCE PRINTED CARD BLOCK (MRA-510) 24
TENSION RELAY PRINTED CARD BLOCK (MR-552, 558) .. 25
AMPLIFIER ASSEMBLY BLOCK 26
POWER SOURCE BLOCK 30

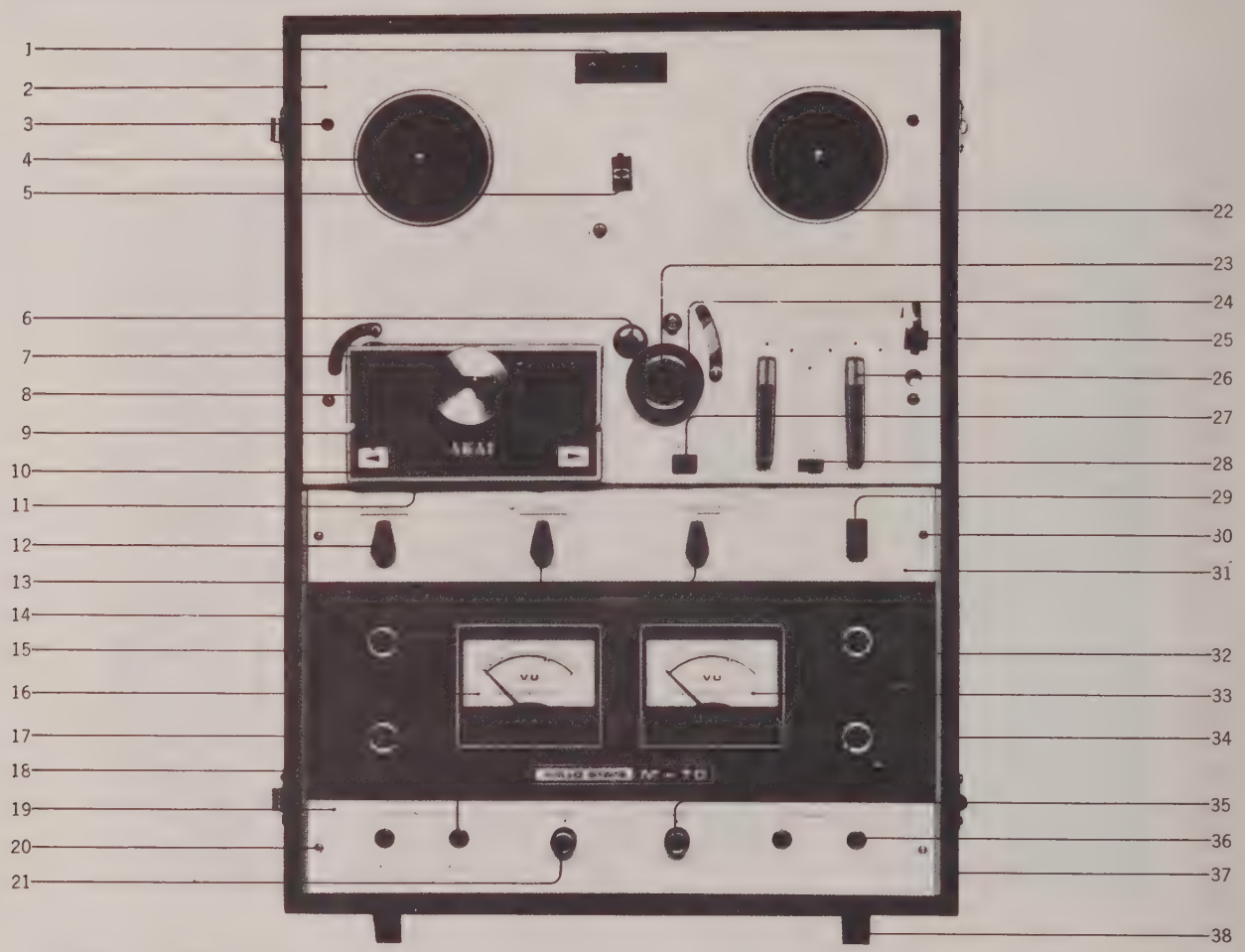
NOTE : * mark shows more than 10 pieces.



CASE BLOCK

Ref. No.	Parts No.	Nomenclature
–	MRA-Z501	MRA Wood Case Assy. Comp.
–	MRA-Z701	MRA Leather Case Assy. Comp.
7	MRA-Z520	LM Rubber Foot
–	MRA-Z521	Screw, Pan head 4 x 25
4	MRA-Z533	Speaker 46E-18 8Ω
–	MRA-Z534	Screw, Countersunk head 3 x 15
–	MRA-Z535	Washer 3.4 x 7.8 x 0.5t
–	MRA-Z536	M3 Nut
3	MRA-Z537	Speaker Escutcheon
1	MRA-Z541	10R Escutcheon
2	MRA-Z543	3R Rubber Foot with Holder
–	MRA-Z545	Washer 5.1 x 20 x 1t
–	MRA-Z546	M5 Nut
6	MRA-Z548	Jack Escutcheon
–	MRA-Z549	Tapping Screw (1 type) 3 x 10 truse head
8	MRA-Z550	MR Oblong Foot
–	MRA-Z551	Screw, Countersunk head 4 x 15
–	MRA-Z554	M3 Lug Plate
–	MRA-Z039	MRA Ventilator
–	MRA-Z040	Screw, truse head 3 x 6

FRONT PANEL BLOCK

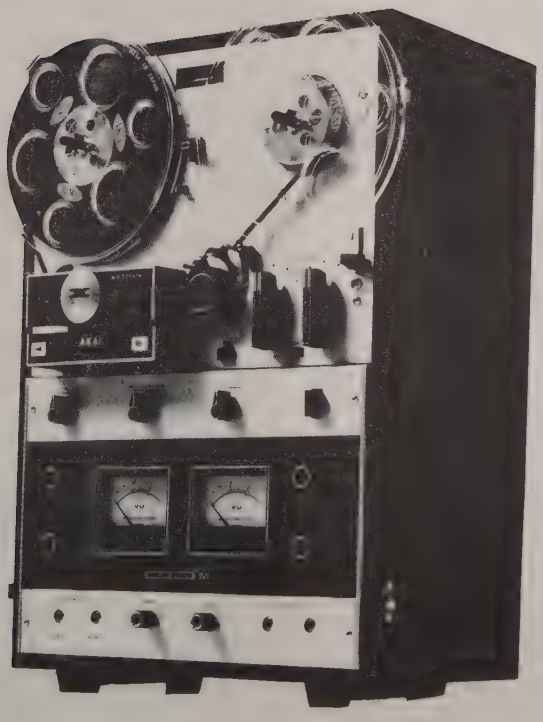


FRONT PANEL BLOCK

Ref. No.	Parts No.	Nomenclature
1	MR-M202	Counter
–	MRA-Z016	Escutcheon, Counter
2	MRA-Z015	Panel, MRA Deck Cover
3	MRA-Z019	Screw, truse head 3 x 6
–	MRA-Z018	Washer 3.3 x 5.8 x 0.25t
4	MR-9001	Supply Reel Table Assy. Comp.
5	MRA-Z035	Knob, Speed Selector
–	MRA-Z036	Set Screw 3 x 4
6	MR-W003	Capstan Shaft only
7	MRA-Z020	Head Cover A
–	MRA-Z021	Screw, truse head 4 x 8
8	MRA-Z022	Knob, Track Selector
–	MRA-Z023	MR Set Screw
9	MRA-Z026	Knob, Delaction Switch
10	MRA-Z024	Head Cover B
11	MRA-Z029	Set Screw, Cover B mt.
12	MRA-Z013	Knob, MRA Rotary Switch
13	MRA-Z013	Knob, MRA Rotary Switch
14	MRA-A086	Panel, MRA Amp.
15	MRA-Z127	Knob, Rec. Level Control
–	MRA-Z128	Set Screw 3 x 5
16	MRA-Z100	VU Meter VH-10
17	MRA-Z127	Knob, Volume Control
18	MRA-Z088	2PM Jack S
19	MRA-Z010	Sub Amp. Panel B
20	MRA-Z011	Screw, truse head 2.3 x 6
21	MRA-Z014	Knob, Bass Control
22	MR-9501	Take-up Reel Table Assy. Comp.
23	MRA-Z030	Cap, Pinch Wheel
24	MRA-Z031	RD Pinch Wheel
25	MRA-Z037	Knob, Instant Stop
–	MRA-Z038	Set Screw 3 x 5
26	MRA-Z032	Knob, MR Mecha. with set screw
–	MRA-Z033	Set Screw
27	MR-M607	REC. Button
28	MR-M181	6P Slide Switch ESD-274U
29	MRA-A126	Knob, Push Button
30	MRA-Z011	Screw, truse head 2.3 x 6
31	MRA-Z009	Sub Amp. Panel A
32	MRA-A127	Knob, Rec. Level Control
33	MRA-A100	VU Meter VH-10
34	MRA-A127	Knob, Volume Control
35	MRA-Z014	Knob, Treble Control
36	MRA-A092	3P64M Jack
37	MRA-Z501	MRA Wood Case Assy. Comp.
–	MRA-Z701	MRA Leather Case Assy. Comp.
–	MRA-Z005	Frame, Amp. Side
38	MRA-Z550	MR Oblong Foot
–	MRA-Z051	4P Mould Plug

X-200D

M-10

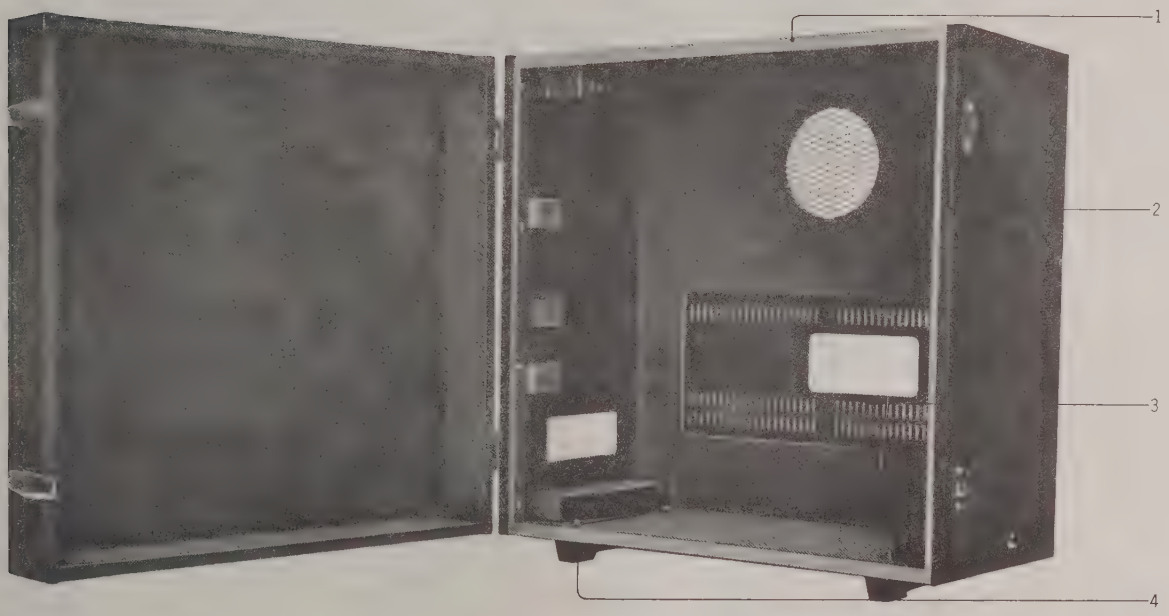


NOTE : * mark shows more than 10 pieces.

FRONT PANEL BLOCK

Ref. No.	Parts No.	Nomenclature
1	MR-M202	Counter
2	MRD-Z501	MRD Case Assy. Comp.
3	MRD-Z015	Screw, truse head 3 x 6
–	MRD-Z014	Washer 3.3 x 5.8 x 0.25t
4	MRD-Z034	Knob, Speed Selector
–	MRD-Z035	Set Screw 3 x 4
5	MR-9001	Supply Reel Table Assy. Comp.
6	MRD-Z012	Panel, MR Deck Cover
7	MRD-Z020	Head Cover A
–	MRD-Z021	Screw, truse head 4 x 8
8	MRD-Z022	Knob, Track Selector
–	MRD-Z023	MR Set Screw
9	MRD-Z024	Head Cover B
10	MRD-Z025	Knob, Delaction Switch
11	MRD-Z027	Set Screw, Cover B mt.
12	MRD-Z016	Panel, MRD Amp.
13	MRD-Z019	Screw, binding head 2.3 x 6
14	MRD-SW201	Slide Switch SL-263 L = 12
15	MRD-A060	VU Meter MG-202
16	MRD-C519	Foot, MR Oblong
17	MR-9501	Take-up Reel Table Assy. Comp.
18	MR-M049	Cycle Change Lever Comp.

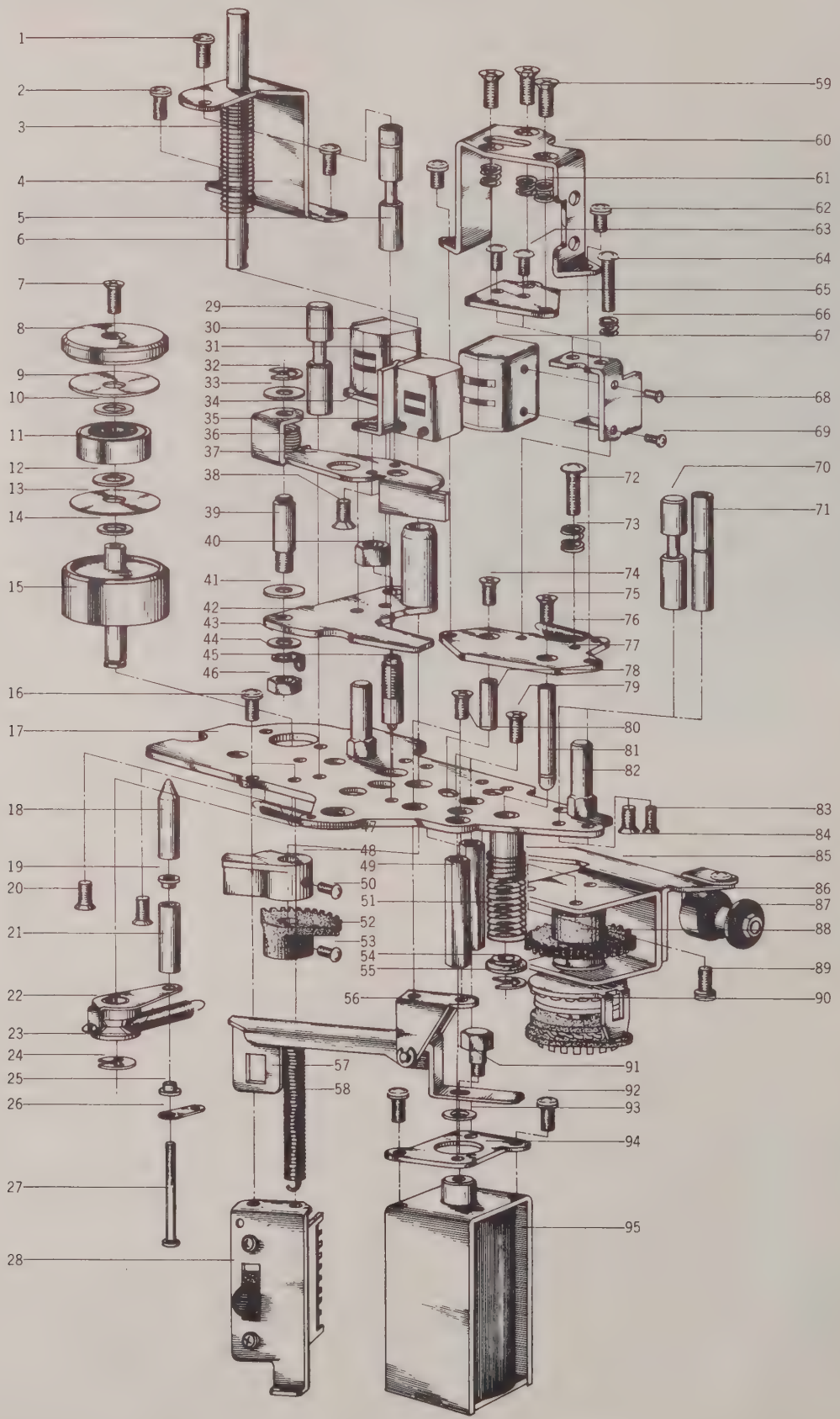
Ref. No.	Parts No.	Nomenclature
19	MR-M167	Reverse Tape Guide
20	MRD-Z036	Knob, Instant Stop
–	MRD-Z037	Set Screw 3 x 5
21	MRD-Z029	Cap, Pinch Wheel
22	MRD-Z030	RD Pinch Wheel
23	MRD-Z031	Knob, MR Mecha. with set screw
–	MRD-Z033	Set Screw
24	MR-M181	6P Slide Switch ESD-274U
25	MR-M607	REC. Button
26	MRD-Z038	Knob, Level Control (Left)
–	MRD-Z039	Set Screw 3 x 7.5
27	MRD-A045	3PM Jack S
28	MRD-Z042	Knob, Level Control (Right)
–	MRD-Z039	Set Screw 3 x 7.5
–	MRD-Z007	LM Rubber Foot
–	MRD-Z009	Tapping Screw (1 types) 4 x 30 truse head
–	MRD-Z011	Tapping Screw (1 types) 4 x 40 truse head
–	MRD-Z013	Counter Escutcheon
–	MRD-Z043	Fuse ST-2 1A

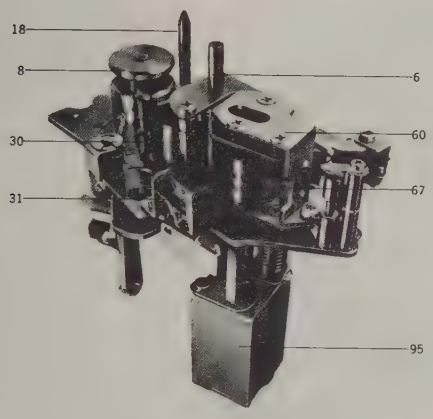


CASE BLOCK

Ref. No.	Parts No.	Nomenclature
–	MRD-Z501	MRD Case Assy. Comp.
4	MRD-Z519	Foot, MR Oblong
–	MRD-Z520	Washer 4.5 x 12.8 x 1t
–	MRD-Z521	Screw, Pan head 4 x 16
1	MRD-Z522	Frame, Case Hold-down
–	MRD-Z523	Wood Screw, Countersunk head 2.4 x 6.3
2	MRD-Z524	Frame, Case Side
–	MRD-Z525	Wood Screw, round head 3.1 x 10
3	MRD-Z040	MRD Ventilator
–	MRD-Z041	Screw, truss head 3 x 6

ILLUSTRATION OF 4TR X-FIELD HEAD BLOCK

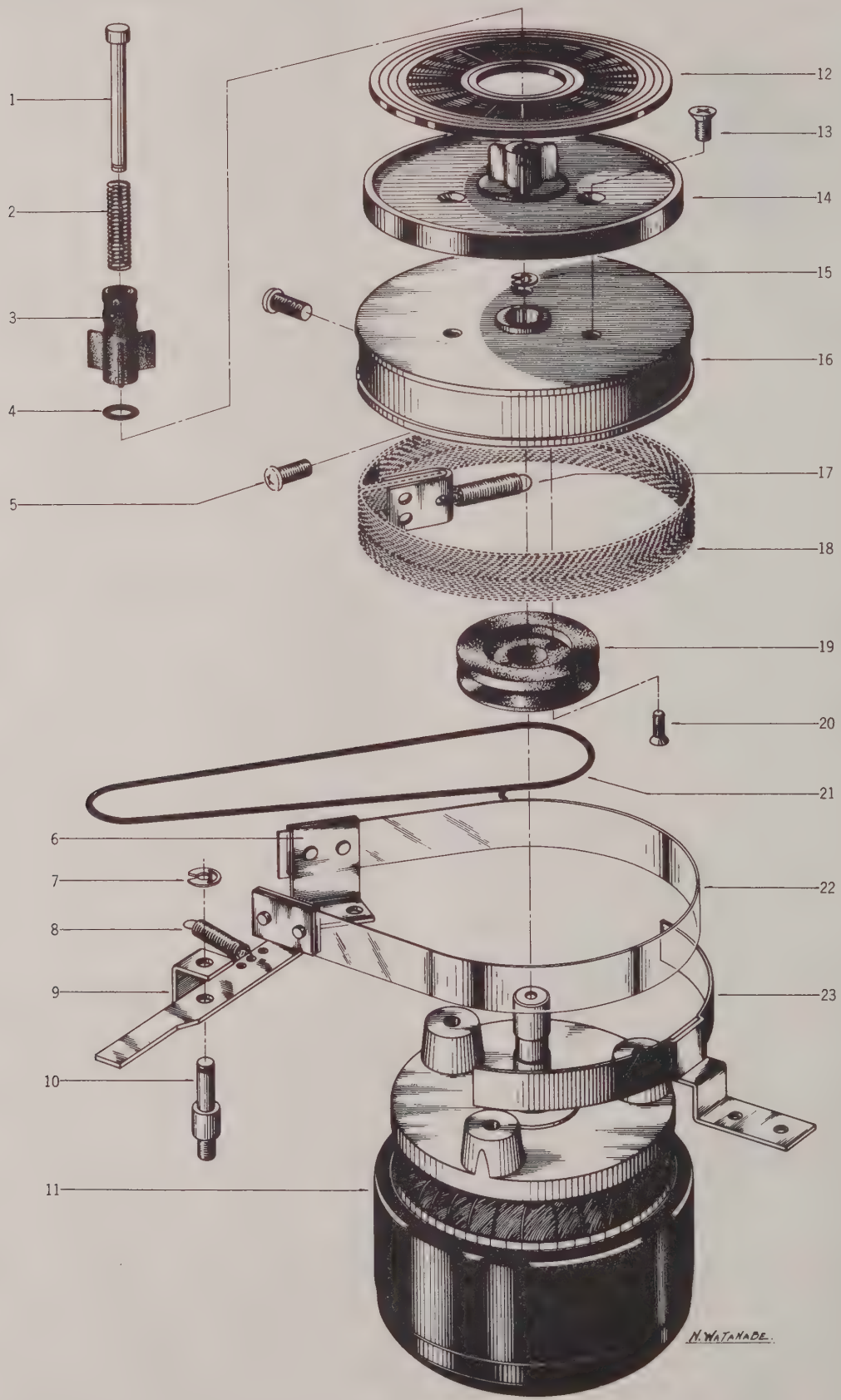




MRD X-FIELD HEAD BLOCK

Ref. No.	Parts No.	Nomenclature
–	MRD-H001	MRD X-Field Head Block Assy. Comp.
1, 2	MR-H089	Screw, binding head 3 x 5 with Washer
3	MR-H087	Spring, Field Hold-down Table
4	MR-H088	Plate, MR Head Hold
5	MR-H007	MR Tape Guide B
6	MR-H053	MR 4TR shaft
7	MR-H119	Screw, Countersunk head 3 x 8
8	MR-H118	Table B, Tape Guide
9	MR-H114	Washer, Tape Guide (Large)
10	MR-H113	Washer, Tape Guide (Small)
11	MR-H115	Ball Bearing 635AHZZ
12	MR-H113	Washer, Tape Guide (Small)
13	MR-H114	Washer, Tape Guide (Large)
14	MR-H120	Washer 5.1 x 10.3 x 0.1t
15	MR-H103	Table A, Tape Guide
–	MR-H112	Shaft, Guide Roller
16	MR-H089	Screw, binding head 3 x 5 with Washer
17	MR-H002	Chassis, Head Assembly
18	MR-H109	Sensing Post
19	MR-H108	Insulater, Coller A
20	MR-H119	Screw, Countersunk head 3 x 8
21	MR-H107	Sensing Coller A
22	MR-H105	Tension Arm with Pulley
23	MR-H122	Spring, Tension Lever
24	MR-H121	Snap Ring E-40
25	MR-H108	Insulater Coller A
26	MR-H110	M2.6 Lug Plate
27	MR-H111	Screw, binding head 2.3 x 25
28	MR-H035	Table, Slide Switch
–	MR-H037	Slide Switch SL242B4V
29	MR-H004	MR Tape Guide A
30	MR-H066	Erase Head E4-5
31	MR-H099	Bias Head B4-1
–	MR-H052	Screw, Pan head 2 x 3
32	MR-H100	"U" Ring 2.85 mm
33	MR-H098	Washer 5.1 x 10.3 x 0.1t
34	MR-H048	Plate, Erase Head Mounting
–	MR-H049	Set Screw
35	MR-H092	Side Plate, Bias Head Mounting
38	MR-H093	Screw, Countersunk head 2 x 5
–	MR-H094	Washer 2.6 x 4.5 x 0.4t
–	MR-H095	M2 Nut
36	MR-H097	Spring, Field Table
37	MR-H091	Field Table
39	MR-H043	Shaft, M7 Field Table
40	MR-H051	Nut 5–0.5
41	MR-H042	M4 Washer
42	MR-H041	Table, Field Hold-down with Metal B
43	MR-H044	M4 Retaining Washer
44	MR-H045	M4 Lug Plate
45	MR-H050	Prop, Erase Table
46	MR-H046	M4 Nut
47	MR-H040	Spring, Tension
48	MR-H055	4TR Cam
49	MR-H026	Prop, Solenoid Mounting
50	MR-H056	Screw, round head 3 x 5.5 D = 5
51	MR-H071	PH Spring
52	MR-H065	Gear B, Head
53	MR-H056	Screw, round head 3 x 5.5 D = 5
54	MR-H072	Spring table
55	MR-H100	"U" Ring 2.85 mm
56, 57	MR-H020	Solenoid Lever with Holder Comp.
58	MR-H039	Spring, Solenoid Lever
59	MR-H080	Screw, Countersunk head 3 x 8
60	MR-H079	Base Angle, Head Mounting
61	MR-H081	Spring, Angle
62	MR-H089	Screw, binding head 3 x 5 with Washer
63	MR-H078	Set Screw, Angle Plate Mounting
64	MR-H085	Screw, round head 3 x 10
65	MR-H077	Angle Table
66	MR-H081	Spring, Angle
67	MR-H076	REC./P.B. Head
68	MR-H075	Angle, Head Mounting
69	MR-H052	Screw, Pan head 2 x 3
70	MR-H004	MR Tape Guide A
71	MR-H016	Sensing Coller B
–	MR-H108	Insulater Coller A
–	MR-H013	Sensing Coller C
–	MR-H018	M3 Lug Plate
–	MR-H019	Screw, binding head 2.3 x 20
–	MR-H014	Screw, Countersunk head 2.3 x 6
72	MR-H085	Screw, round head 3 x 10
73	MR-H084	Spring, Angle Adjust
74	MR-H014	Screw, Countersunk head 2.3 x 6
75	MR-H074	Screw, Countersunk head 3 x 6
76	MR-H090	Tension Spring
77	MR-H067	Base Plate
78	MR-H068	4TR Hold-down Guide
79	MR-H074	Screw, Countersunk head 3 x 6
80	MR-H074	Screw, Countersunk head 3 x 6
81	MR-H070	PH Shaft
82	MR-H009	Prop A, Head Cover
83	MR-H014	Screw, Countersunk head 2.3 x 6
84	MR-H005	Screw, Countersunk head 3 x 8
85	MR-H128	Table, Cancel Coil
86	MR-H057	4TR Switch Table
87	MR-H129	Ham Backing Coil 15T
88	MR-H063	Gear A, Head
89	MR-H089	Screw, binding head 3 x 5 with Washer
90	MR-H062	Rotary Switch SR25N-143
91	MR-H030	Planger Volt
92	MR-H089	Screw, binding head 3 x 5 with Washer
93	MR-H032	Washer
94	MR-H025	Table, Solenoid
95	MR-H028	Solenoid RCA10143
–	MR-H033	Nylon Clip HP-2N
–	MR-H125	5P T.V. Consent Plug
–	MR-H126	3P Socket

ILLUSTRATION OF REEL TABLE AND REEL MOTOR BLOCK

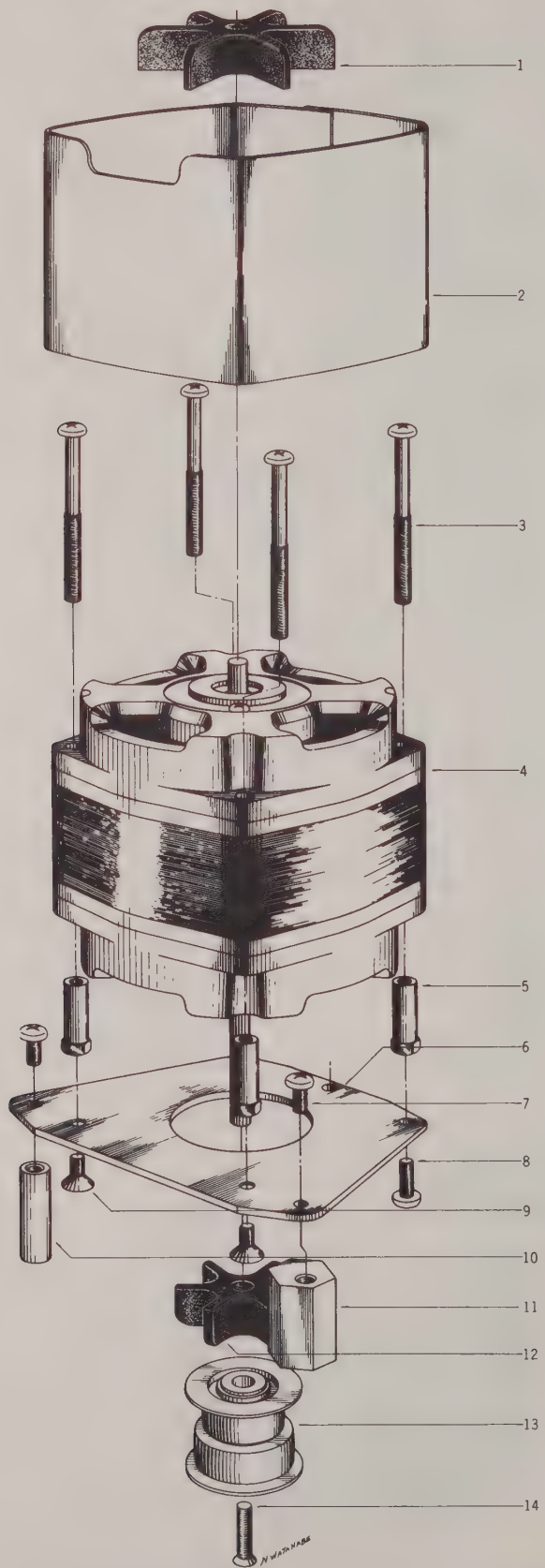


REEL MOTOR & REEL TABLE BLOCK

Supply and Take-up Reel Assemblies are symmtry. For the Supply Reel Assembly Component Parts, we refer you the Take-up Reel Assembly Component Parts illustrated here.

Ref. No.	Parts No.	Nomenclature
11	MR-X501	Reel Motor Assy. Comp. (24 x 0-II)
–	MR-9501	Take-up Reel Table Assy. Comp.
–	MR-9001	Supply Reel Table Assy. Comp.
14	MR-9502	MR Reel Table
3	MR-9503	Reel Retainer
1	MR-9504	Shaft, Reel Retainer
2	MR-9505	Spring, Reel Retainer
4	MR-9506	Rubber Ring 3R
15	MR-9507	"E" Ring 1.9 mm
16	MR-9508	Take-up, Brake Wheel
–	MR-9008	Supply, Brake Wheel
13	MR-9509	Screw, Counter sunk head 3 x 8
12	MR-9510	Rubber Plate, Reel Table
18	MR-9511	Cloth tape, Brake Wheel
–	MR-9512	Holder U, Cloth tape
17	MR-9513	Spring, Cloth tape Tension
19	MR-9514	Pulley, Counter (Take-up only)
20	MR-9515	Screw, Counter sunk head 2.3 x 8
5	MR-9516	Screw, Pan head 4 x 10
–	MR-M143	Brake Lever A Comp. (Take-up)
–	MR-M153	Brake Lever B Comp. (Supply)
6	MR-M147	Retaining, Brake Band
7	MR-M151	"U" Ring 2.85 mm
8	MR-M150	Spring, Brake Lever
9	MR-M145	Brake Lever A (Take-up)
–	MR-M154	Brake Lever B (Supply)
–	MR-M146	Screw, binding head 3 x 5
10	MR-M014	Prop, Brake Lever
22	MR-M144	Brake Band
–	MR-M057	Reel Motor Shield (Take-up only)
–	MR-M058	Screw, Pan head 4 x 6
–	MR-M059	M4 Nut
21	MR-M207	Counter Belt
23	MR-M208	Guide, Brake Band
–	MR-M146	Screw, binding head 3 x 5

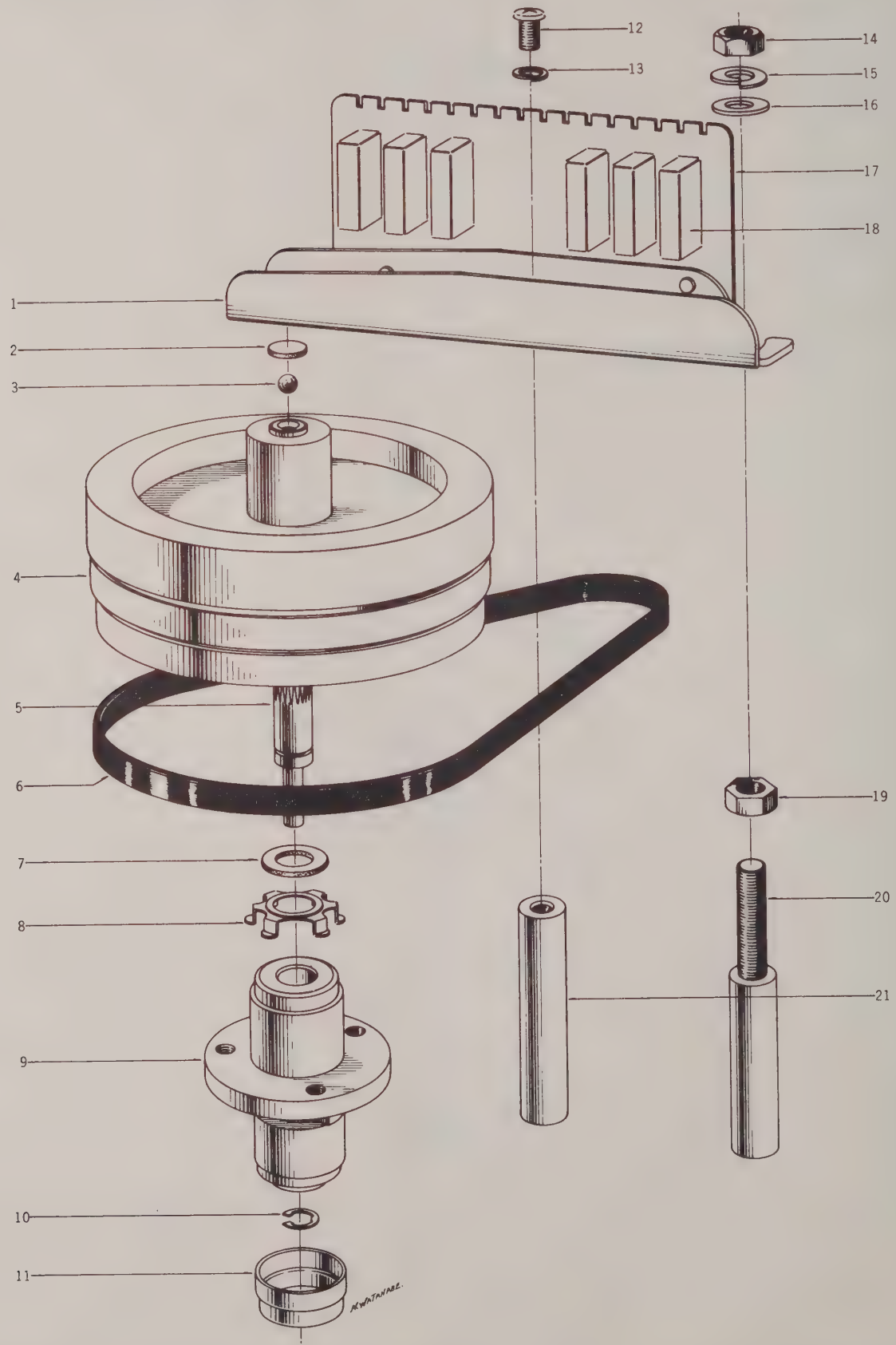
ILLUSTRATION OF MAIN MOTOR BLOCK



MAIN MOTOR BLOCK

Ref. No.	Parts No.	Nomenclature
4	MR-X001	Main Motor Assy. Comp. (16X)
2	MR-X085	Shield Case
3	MR-X068	Screw, Pan head 4 x 50 with Washer
5	MR-X069	Prop, Motor Mounting
6	MR-X070	Plate, MR Motor Mounting
7, 8	MR-X073	Screw, Pan head 4 x 10
9	MR-X074	Screw, Countersunk head 4 x 10
10	MR-X071	Prop A, Motor
11	MR-X072	Prop. MR Motor
12	MR-X060	MR Motor Fan (Rubber)
13	MR-X056	Pulley, MR Motor
14	MR-X059	Screw, oval countersunk head 3 x 15
1	MR-X101	Motor Fan (Rubber)
–	MR-M073	Screw, Pan head 4 x 6

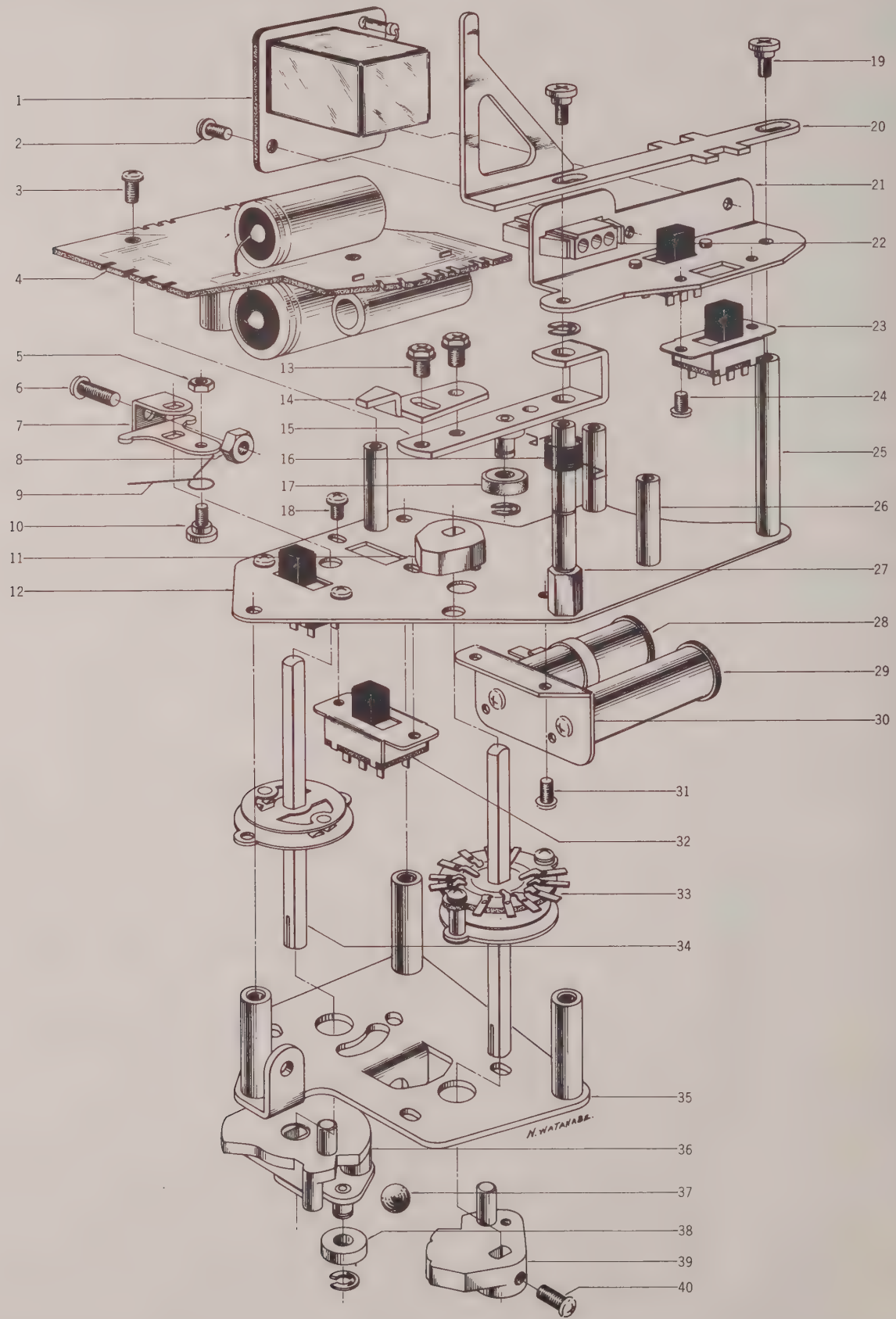
ILLUSTRATION OF FLYWHEEL BLOCK



FLYWHEEL BLOCK

Ref. No.	Parts No.	Nomenclature
–	MR-W001	Capstan Flywheel Assy. Comp.
4	MR-W002	24 Flywheel only
5	MR-W003	Capstan Shaft only
–	MR-W005	Screw, without head 5 x 6
7	MR-W004	Nylon Washer 7.9 x 13 x 1t
9	MR-W006	24 Main Metal Case A Comp.
8	MR-W010	Spring Plate (Star Type)
10	MR-W011	"E" Ring
11	MR-W013	Main Metal Cap B
–	MR-M100	Screw, Pan head 4 x 10
–	MR-M101	Screw, Countersunk head 4 x 10
–	MR-M102	Screw, Countersunk head 4 x 10 D = 8.5
21	MR-M023	Prop A, Flywheel
–	MR-M024	Screw, Pan head 4 x 10
20	MR-M026	Prop B, Flywheel
19	MR-M112	Nut 1/4" 20T
1	MR-M103	Plate MR, Flywheel
2	MR-M104	Nylon Plate 8 mm
17	MR-M105	Spark Quencher Printed Card Assy. Comp.
18	MR-M106	Spark Quencher 0.033μ + 120Ω 500WV
–	MR-M107	Screw, binding head 3 x 5
6	MR-M108	Capstan Drive Belt D
3	MR-M109	4 mm Steel Ball
12	MR-M110	Screw, Pan head 4 x 8
13	MR-M111	M4 Spring Washer
14	MR-M112	Nut 1/4" 20T
15	MR-M113	1/4" Spring Washer
16	MR-M114	Washer 6.8 x 12.7 x 1t

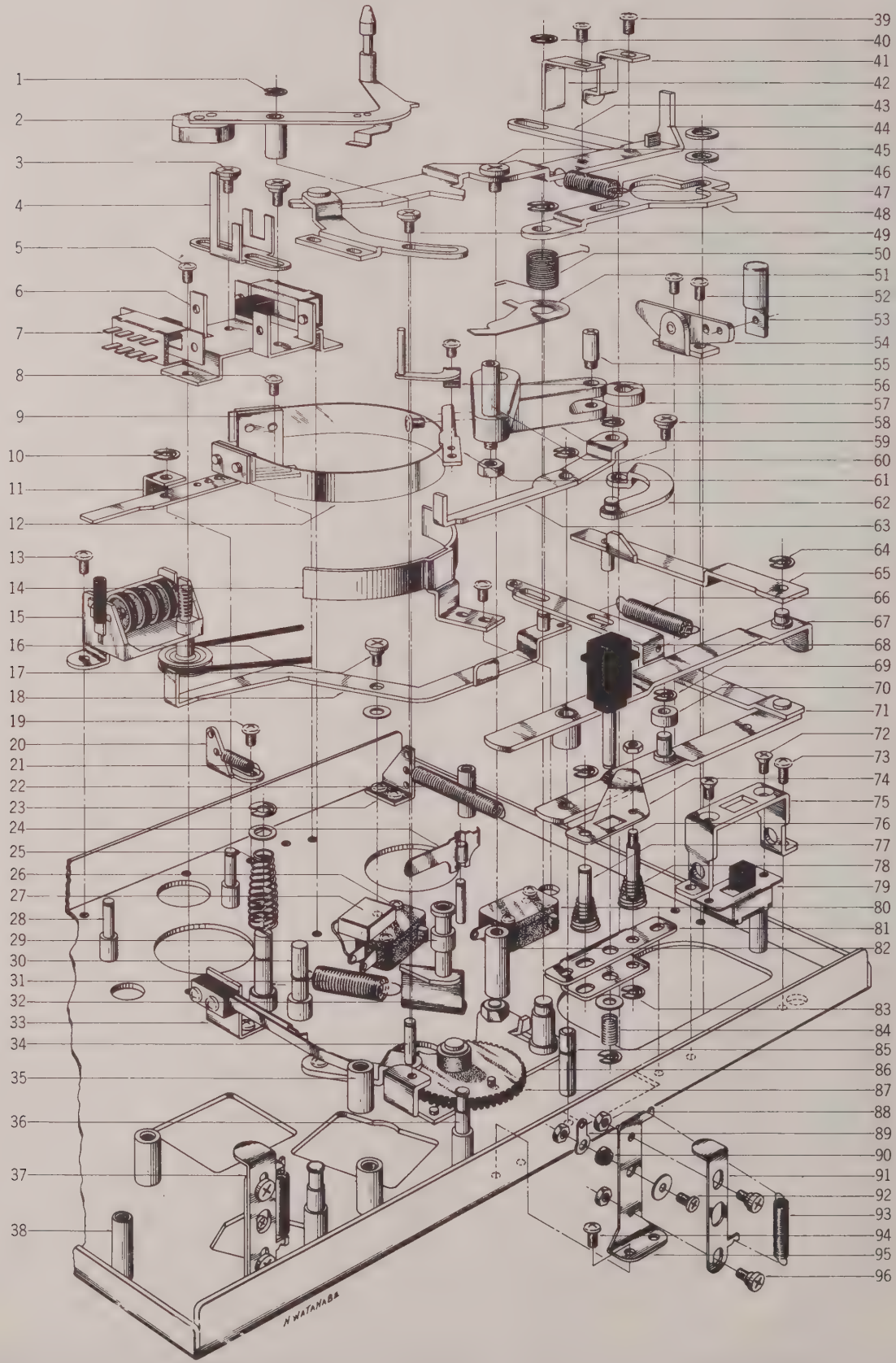
ILLUSTRATION OF SWITCH LEVER BLOCK



SWITCH LEVER BLOCK

Ref. No.	Parts No.	Nomenclature
35	MR-3001	Switch Table A-2 with Prop
33	MR-3003	Rotary Switch Y-133 (Play. Shaft)
–	MR-3004	M3 Retaining Washer
–	MR-3005	M3 Nut
34	MR-3006	Fast Forward/Rewind Shaft
–	MR-3007	Screw, binding head 3 x 5 with Washer
–	MR-3008	Plate Nut
–	MR-3009	Carbon Resistor RD1/4 68K (K)
36	MR-3010	Cam A-3 with Roller Plate
38	MR-3014	Cam Roller 12 mm
–	MR-3015	"U" Ring 2.85 mm
–	MR-3016	Screw, Pan head 4 x 8
37	MR-3017	Steel Ball 8 mm
39	MR-3018	Cam B
40	MR-3016	Screw, Pan head 4 x 8
12	MR-3020	Control Chassis
26	MR-3021	Prop, M9 Panel
–	MR-3022	Screw, binding head 3 x 5
25	MR-3023	Prop, Cycle switch
27	MR-3044	Prop, Rec. Lever
30	MR-3025	Plate, Resistor Mounting
29	MR-3026	Resistor RWH20G 220ΩJ
28	MR-3027	Resistor RWH20HIG 22.5Ω x 2K
18, 31	MR-3022	Screw, binding head 3 x 5
32	MR-3034	Slide Switch ESD-274U
–	MR-3036	Spark Quencher 0.033 + 120Ω 500WV
7	MR-3037	Cam, Changing Switch
10	MR-3038	Set Screw
9	MR-3039	Spring, Switch
5	MR-3005	M3 Nut
8	MR-3041	M4 Nut
6	MR-3042	Screw, Pan head 4 x 10
–	MR-3043	Hexagon head Screw 4 x 8
4	MR-504	System Control Printed Card Assy. Comp.
3	MR-3046	Screw, binding head 3 x 5 with Washer
11	MR-3048	Cam B, Amp. Switch
15	MR-3101	Lever A, Switch with Prop
14	MR-3102	Lever B, Switch
13	MR-3103	Hexagon head Screw 4 x 7 with Washer
17	MR-3104	Cam Roller A
16	MR-3050	Spring H
–	MR-3015	"U" Ring 2.85 mm
1	MR-552	Tension Relay Printed Card Assy. Comp. (MR-552)
2	MR-3046	Screw, binding head 3 x 5 with Washer
22	MR-3053	3P Plug
–	MR-3055	6P Socket
21	MR-3057	Switch Table, Sycle
23	MR-3058	Slide Switch ESD-271DU
24	MR-3059	Screw, round head 3 x 5
19	MR-3060	Set Screw
20	MRD-3061	Lever, Sycle Changing

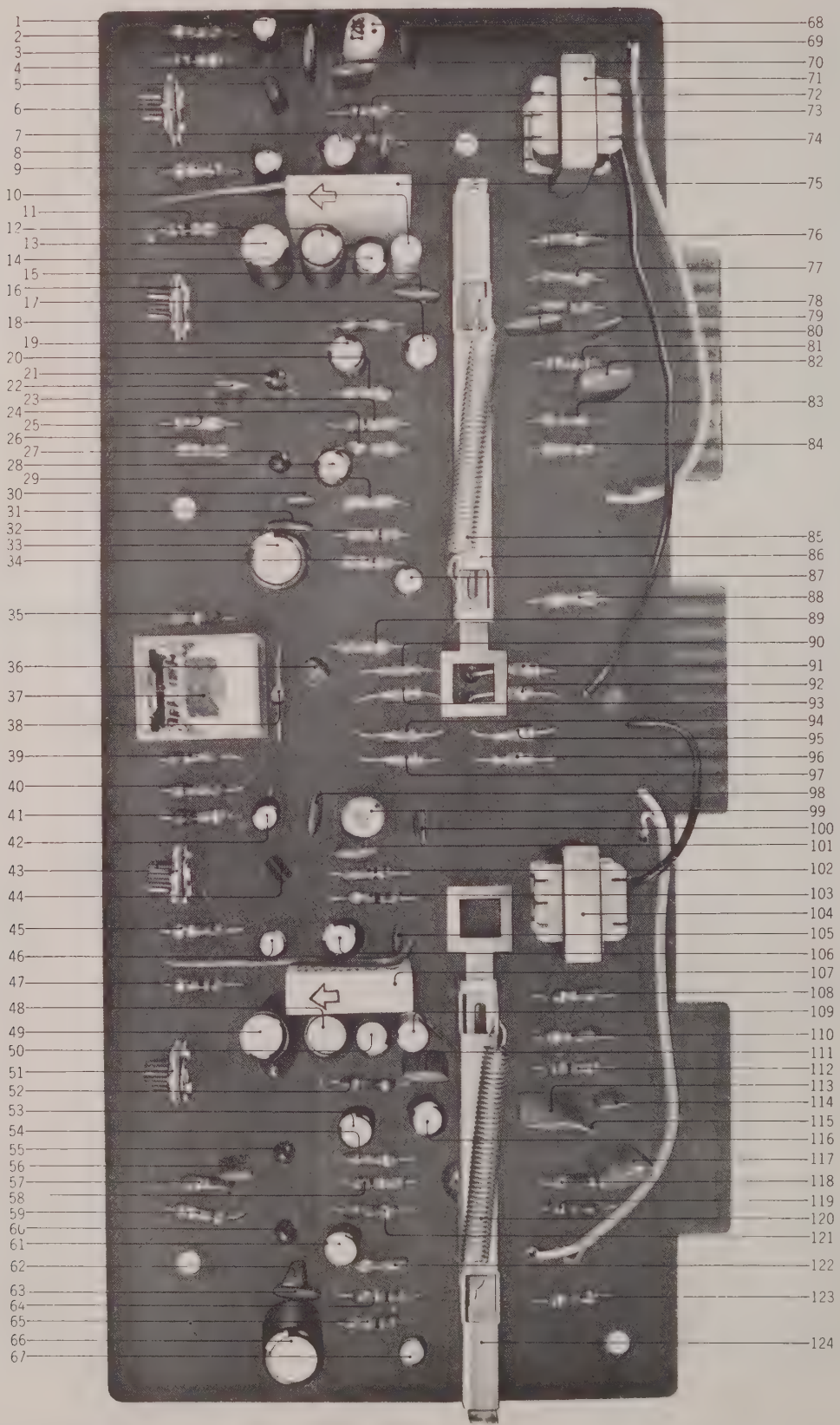
ILLUSTRATION OF MECHANISM ASSEMBLY BLOCK



MECHANISM ASSEMBLY BLOCK

Ref. No.	Parts No.	Nomenclature
1	MR-M151	"U" Ring 2.85 mm
2	MR-M701	MR AS Lever Comp.
–	MR-M203	Spring, AS Lever
3	MR-M503	Set Screw C
4	MR-M502	Lever, Speed Switch
5	MR-M190	Screw, round head 3 x 4
6	MR-M501	Table, Speed Switch
7	MR-M505	Slide Switch ESD-281DU
8	MR-M146	Screw, binding head 3 x 5
9	MR-M147	Retaining, Brake Band
10	MR-M151	"U" Ring 2.85 mm
11	MR-M143	Brake Lever A Comp. (Take-up)
–	MR-M153	Brake Lever B Comp. (Supply)
12	MR-M144	Brake Band
13	MR-M146	Screw, binding head 3 x 5
14	MR-M208	Guide, Brake Band
15	MR-M202	MR Counter
16	MR-M207	Counter Belt
17	MR-M063	MR Set Screw
18	MR-M060	Brake Lever C with Pin
19	MR-M146	Screw, binding head 3 x 5
20	MR-M031	Holder, MR Spring
21	MR-M150	Spring, Brake Lever
22	MR-M084	Spring, D Lever
23	MR-M029	Holder B, Spring
24	MR-M184	Lever, Operation Switch
–	MR-M185	"E" Ring 1.9 mm
25	MR-M053	Spring B, Sycle Change
–	MR-M049	Cycle Change Lever Comp.
–	MR-M050	Spring, Cycle Change Lever Tension
–	MR-M151	"U" Ring 2.85 mm
26	MR-M186	Micro Switch V-1A-442
-	MR-M188	Screw, binding head 3 x 15
27	MR-M189	Spark Quencher 0.1μ + 120Ω 250WV
28	MR-M014	Prop, Brake Lever
29	MR-M167	Reverse Tape Guide
–	MR-M168	Set Screw 3 x 5
31	MR-M136	Spring A
32	MR-M165	Table, Reverse Guide with Prop
33	MR-M172	Tansion Switch Comp.
	MR-M179	Screw, round head 3 x 3
34	MR-M120	Table, AS Lever with Prop
–	MR-M123	Screw, binding head 3 x 5 with Lug Plate
35	MR-M006	Prop E, Head Mounting
36	MR-M009	Prop B, Head-Cover
37	MR-M801	Delaction Switch Comp.
38	MR-M004	Prop, Mecha. Panel
39	MR-M146	Screw, binding head 3 x 5
40	MR-M151	"U" Ring 2.85 mm
41	MR-M194	Stopper, Instant Stop
42	MR-M197	Lever, Shut off Switch
43	MR-M092	IB Lever
44	MR-M191	Lever, MR Instant Stop with Set Screw
46	MR-M128	Nylon Washer 6.1 x 10 x 0.5t
47	MR-M196	Spring, Instant Stop
48	MR-M127	Lever, Automatic Mechanism
49	MR-M201	Set Screw, Amp. Lever
50	MR-M126	Spring, Stopper
51	MR-M125	Gear Stopper
52	MR-M179	Screw, round head 3 x 3
53	MR-M069	Start Button
54	MR-M066	Start Lever A, with Lever B-2
55	MR-M135	Shaft A, Cam Roller
56	MR-M139	Shifter Lever B, with Pin
57	MR-M134	Cam Roller 13 mm
58	MR-M097	Set Screw, Amp. Lever
59	MR-M130	Lever, MR Pinch Roller Comp.
61	MR-M138	Shifter Lever A
62	MR-M094	Field Lever E, with Pin
63	MR-M096	MR Field Lever B
64	MR-M151	"U" Ring 2.85 mm
65	MR-M089	MR C Lever, with Pin
66	MR-M062	IB Spring
67	MR-M086	MR Lever A, with Metal A
68	MR-M607	REC, Button
69	MR-M151	"U" Ring 2.85 mm
70	MR-M080	Cam Roller 9 mm
71	MR-M078	MR Lever B with Lever D Comp.
72	MR-M182	Screw, Countersunk head 3 x 5
73	MR-M146	Screw, binding head 3 x 5
74	MR-M602	Cam Stopper
75	MR-M180	Angle, Automatic Switch
76	MR-M603	Shaft, Stopper
77	MR-M611	Shaft B, Stopper
78	MR-M604	Spring
79	MR-M181	6P Slide Switch ESD-274U
80	MR-M186	Micro Switch V-1A-442
81	MR-M601	Table, Stopper
82	MR-M011	Shaft, Pinch Roller Arm
83	MR-M151	"U" Ring 2.85 mm
84	MR-M609	Spring, REC. Button
85	MR-M016	Shaft, M7 A Lever
86	MR-M901	Table, Eccentric Gear
87	MR-M902	Eccentric Gear
88	MR-M807	M2.3 Nut
89	MR-M805	M2.6 Lug Plate
90	MR-M803	Insulater Coller B
91	MR-M808	Plate, Delaction Switch
92	MR-M806	Screw, binding head 2.3 x 5
–	MR-M804	Washer, Insulater
93	MR-M811	DS Spring
94	MR-M146	Screw, binding head 3 x 5
95	MR-M802	Table, Delaction Switch
96	MR-M809	Set Screw, Small
–	MR-M035	MP Condenser 3 + 1μ 260WV AC
–	MR-M036	Spark Quencher 0.1μ + 120Ω 500 WV
–	MR-M041	Table, Condenser Mounting
–	MR-M044	MP Condenser 2 + 1μ 250WV AC
–	MR-M046	Shield, Rotary Switch

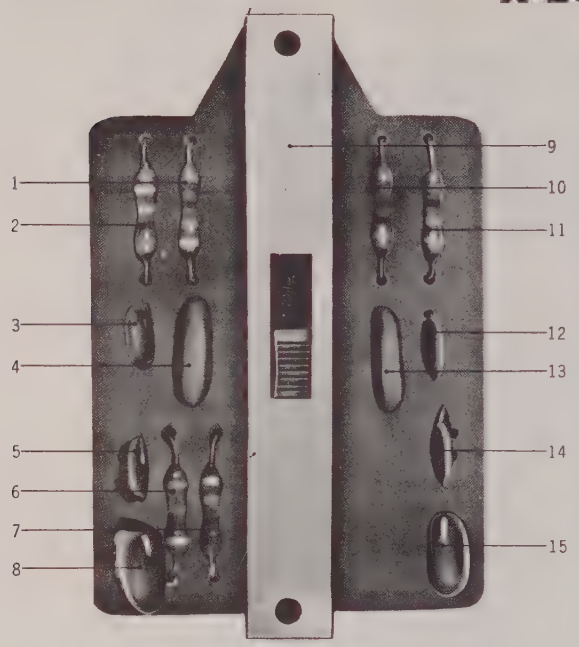
PRE-AMP. PRINTED CARD BLOCK (MR-501)



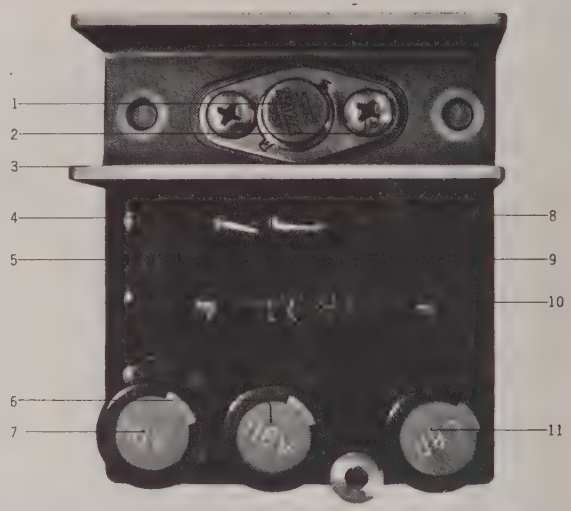
PRE-AMP. PRINTED CARD BLOCK (MR-501)

Ref. No.	Parts No.	Nomenclature
–	MR-501	Pre-Amp. Printed Card Assy. Comp.
86, 124	MR-SW101	Slide Switch CL162B35
85, 120	MR-SW101S	Spring for Slide Switch
37	MR-RL101	Relay TECK-19 1500Ω
27, 60	MR-TR101	Transistor 2SC693 (F), U
21, 55	MR-TR102	Transistor 2SC693 (F), U
5, 44	MR-TR103	Transistor 2SC458 (B)
36	MR-TR104	Transistor 2SC372
		Carbon Resistor, Insulator Type
88, 123	MR-R101	RD1/4 4.7K (K)
32, 64	MR-R102	RD1/4 100K (J)
34, 65	MR-R103	RD1/4 100K (J)
29, 122	MR-R104	RD1/4 3.3K (K)
24, 121	MR-R105	RD1/4 330Ω (K)
23, 58	MR-R106	RD1/4 100K (J)
26, 59	MR-R107	RD1/4 150K (J)
25, 57	MR-R108	RD1/4 22K (K)
20, 54	MR-R109	RD1/4 4.7K (K)
81, 115	MR-R110	RD1/4 120K (K)
83, 118	MR-R111	RD1/4 68K (K)
84, 119	MR-R112	RD1/4 22K (K)
78, 112	MR-R113	RD1/4 10K (J)
18, 52	MR-R114	RD1/4 4.7K (K)
76, 108	MR-R115	RD1/4 22K (K)
77, 110	MR-R116	RD1/4 22K (K)
11, 47	MR-R117	RD1/4 10K (K)
73, 103	MR-R118	RD1/4 10K (K)
35, 39	MR-R119	RD1/4 2.4K (J)
3, 41	MR-R120	RD1/4 10K (K)
9, 45	MR-R121	RD1/4 120K (K)
2, 40	MR-R122	RD1/4 15K (K)
72, 102	ME-R123	RD1/4 1K (K)
89	MR-R124	RD1/4 22K (K)
		Condenser Vertical mt. Type
67, 87	MR-C101	Elect. 10μ 10WV
31, 63	MR-C102	VFM 220P (K) 50WV
30, 62	MR-C103	Mylar 0.001μ (K) 50WV
28, 61	MR-C104	Elect. 33μ 3.15WV
22, 56	MR-C105	VFM 100P (K) 50WV
19, 53	MR-C106	Elect. 33μ 3.15WV
82, 117	MR-C107	Mylar 0.15μ (K) 35WV
80, 113	MR-C108	VFM 330P (K) 50WV
79, 114	MR-C109	Mylar 0.012μ (J) 50WV
17, 116	MR-C110	Elect. 4.7μ 25WV
33, 66	MR-C111	Elect. 47μ 25WV
13, 49	MR-C112	Elect. 33μ 25WV
15, 111	MR-C113	VFM 220P (K) 50WV
10, 109	MR-C114	Elect. 1μ 50WV
14, 50	MR-C115	Elect. 33μ 3.15WV
–	MR-C116	VFM. 150P (K) 50WV
12, 48	MR-C117	Elect. 100μ 6.3WV
1, 42	MR-C118	Elect. 1μ 50WV
4, 98	MR-C119	VFM 220P (K) 50WV
74, 105	MR-C120	Mylar 0.01μ (K) 50WV
7, 106	MR-C121	Elect. 4.7μ 50WV
8, 46	MR-C122	Elect. 10μ 10WV
70, 101	MR-C123	Mylar 0.033μ (K) 50WV
69, 100	MR-C124	Mylar 0.01μ (K) 50WV
75, 107	MR-IC101	IC, Line Amp. EHD-AA072D
71, 104	MR-T101	Transformer, Headphone N19-228S 7K : 8Ω
90, 97	MR-D101	Germanium Diode 1N46A
93, 94	MR-D102	Germanium Diode 1N46A
91, 96	MR-D103	Germanium Diode 1N46A
92, 95	MR-D104	Germanium Diode 1N46A
38	MR-D105	Silicon Diode V06C
–	MR-L101	Inductive Coil SL-22000 22 mH (J)
68, 99	MR-L102	Inductive Coil SL-3000 3 mH (J)
16, 51	MR-VR101	Semi-variable Resistor V10K5 20KB
6, 43	MR-VR102	Semi-variable Resistor V10K5 2KB

EQUALIZATION PRINTED CARD BLOCK (MRD-502)



POWER SOURCE PRINTED CARD (MRD-503)

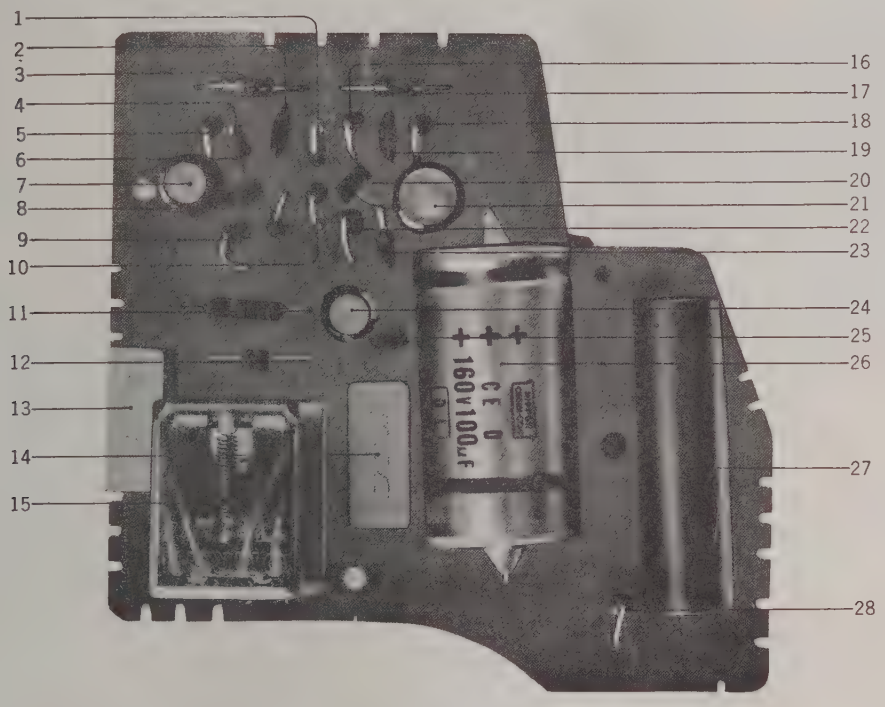


EQUALIZATION PRINTED CARD BLOCK (MRD-502)

Ref. No.	Parts No.	Nomenclature
–	MRD-502	Equalization Printed Card Assy. Comp.
9	MRD-SW201	Slide Switch SL-263 L = 12
		Carbon Resistor, Insulator Type
10	MRD-R201	RD1/4 8.2K (J)
11	MRD-R202	RD1/4 82K (K)
1	MRD-R203	RD1/4 8.2K (J)
2	MRD-R204	RD1/4 82K (K)
6	MRD-R205	RD1/4 47K (K)
7	MRD-R206	RD1/4 22K (K)
		Condenser Vertical mt. Type
12	MRD-C201	VFM 100P (K) 50WV
13	MRD-C202	HIQ 620P (K) 50WV
14	MRD-C203	Mylar 0.015μ (K) 50WV
15	MRD-C204	Mylar 0.056μ (K) 50WV
3	MRD-C205	VFM 100P (K) 50WV
4	MRD-C206	HIQ 620P (K) 50WV
5	MRD-C207	Mylar 0.015μ (K) 50WV
8	MRD-C208	Mylar 0.056μ (K) 50WV

POWER SOURCE PRINTED CARD (MRD-503)

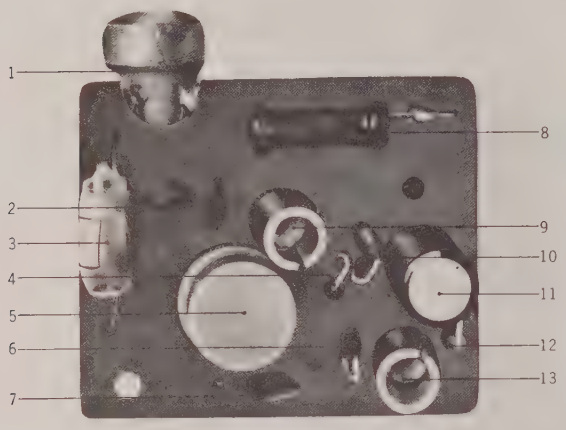
Ref. No.	Parts No.	Nomenclature
–	MRD-503	Power Source Printed Card Assy. Comp.
1	MRD-T401	Transistor 2SD223 (Y)
3	MRD-TC 401	Transistor Cooler for 2SD223
2	MRD-TS 401	Screw, Binding Head 3 x 8
–	MRD-TN 401	Nut M3
5	MRD-D401	Silicon Diode SB-3-01P
8	MRD-D402	Zener Diode RD-24A (M)
4	MRD-R401	Carbon Resistor with Stopper RD1/4 4.7K (J)
10	MRD-R402	Wire-wound Resistor L Type 3WL 18Ω (J)
9	MRD-R403	Carbon Resistor with Stopper RD1/4 47Ω
6	MRD-C401	Elec. Condenser Vert. mt. Type 100μ 50WV
7	MRD-C402	Elec. Condenser Vert. mt. Type 100μ 50WV
11	MRD-C403	Elec. Condenser Vert. mt. Type 220μ 25WV

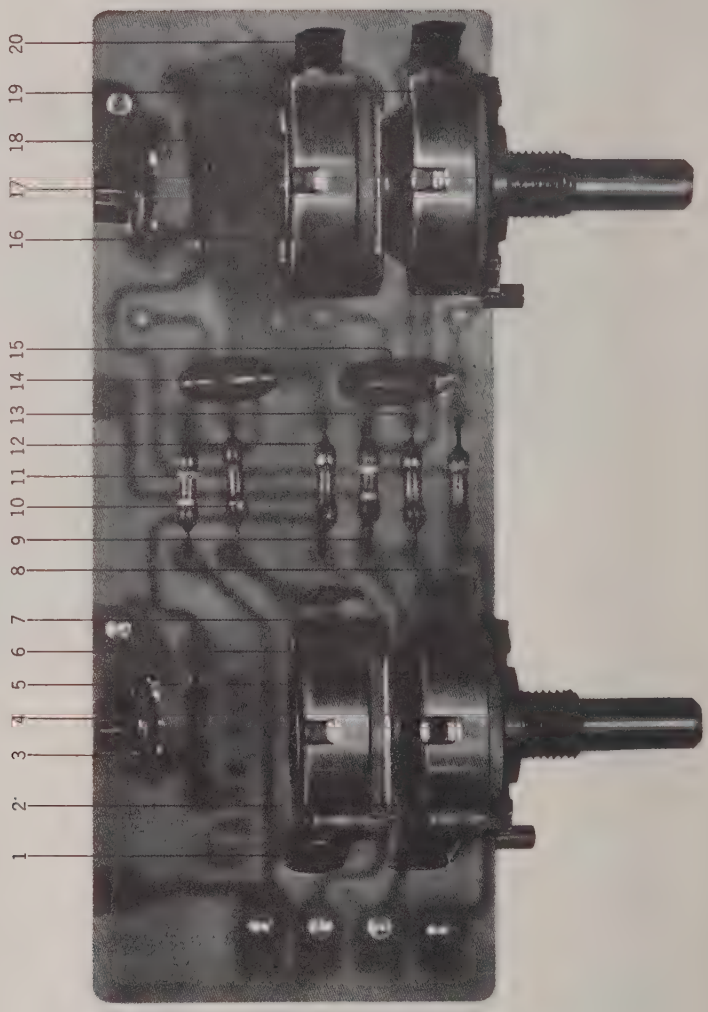


SYSTEM CONTROL PRINTED CARD BLOCK (MR-504)

Ref. No.	Parts No.	Nomenclature
–	MR-504	System Control Printed Card Assy. Comp.
15	MR-RL0201	Relay MY4-0-AD8 DC20V
13	MR-CR0201	Spark Quencher 0.1μ + 120Ω 500V
14	MR-CR0202	Spark Quencher 0.1μ + 120Ω 250V
12	MR-D0201	Silicon Diode V06C
–	MR-D0202	Silicon Diode 10D4
17	MR-D0203	Germanium Diode IN34A
3	MR-D0204	Germanium Diode IN34A
6	MR-TR0201	Transistor 2SC372
20	MR-TR0202	Transistor 2SC372
25	MR-TR0203	Transistor 2SC372
		Carbon Resistor with Stopper
9	MR-R0201	RD1/4 2.2K (K)
8	MR-R0202	RD1/4 47K (K)
10	MR-R0203	RD1/4 47K (K)
1	MR-R0204	RD1/4 10K (K)
16	MR-R0205	RD1/4 10K (K)
5	MR-R0206	RD1/4 47K (K)
18	MR-R0207	RD1/4 47K (K)
4	MR-R0208	RD1/4 47K (K)

Ref. No.	Parts No.	Nomenclature
23	MR-R0209	RD1/4 10K (K)
22	MR-R0210	RD1/4 2.2K (K)
28	MR-R0212	RD1/4 220K (K)
11	MR-R0211	Solid RD1/4 1.8K (K)
27	MR-R0213	Corted Wire-wound Resistor, Lug Type RWH 15G 1.5K (J)
		Condenser
24	MR-C0201	Elect. Vertical mt. Type 47μ 16WV
7	MR-C0202	Elect. Vertical mt. Type 47μ 16WV
2	MR-C0203	Mylar Vertical mt. Type 0.022μ (K) 50WV
19	MR-C0204	Mylar Vertical mt. Type 0.022μ (K) 50WV
21	MR-C0205	Elect. Vertical mt. Type 100μ16WV
26	MR-C0206	Elect. Tubular Type 100μ 160WV
–	MR-C0207	Elect. Tubular Type 47μ 160WV



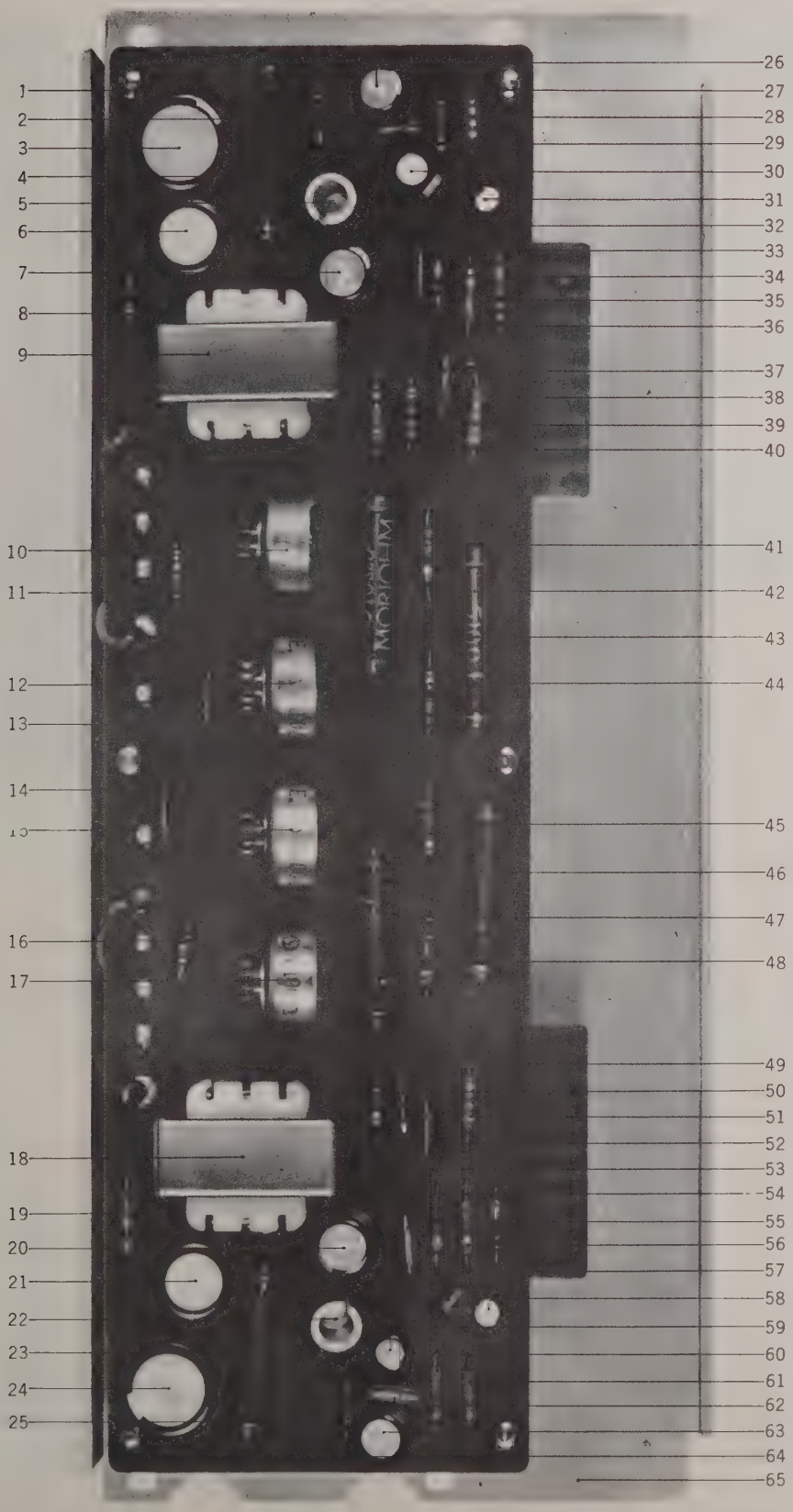


OSC. PRINTED CARD BLOCK (MR-505)

Ref. No.	Parts No.	Nomenclature
–	MR-505	OSC. Printed Card Assy. Comp.
13	MR-TR0101	Transistor 2SC971 (2) (3) Red
9	MR-TR0102	Transistor 2SC971 (2) (3) Red
5	MR-T0101	OSC. Coil OT-104A
1	MR-L0101	Voltage Adjusting Coil AKI-207
		Carvon Resistor with Stopper
4	MR-R0101	RD1/4 4.7K (K)
6	MR-R0102	RD1/4 470Ω (K)
10	MR-R0103	RD1/4 3.3Ω (J)
12	MR-R0104	RD1/4 3.3Ω (J)
8	MR-R0105	L Type RD 1L 22Ω (K)
		Condenser
7	MR-C0101	Mylar, Vartical mt. Type 0.01μ (K) 50WV
2	MR-C0102	Mylar, Vartical mt. Type 0.01μ (K) 50WV
11	MR-C0103	Elect., Vartical mt. Type 100μ 25WV
3	MR-C0104	Plastic, Tubular Type 1000P (J) 500WV
–	MR-505F	OSC. Frame
–	MR-505C	Coller 6 x 6
–	MR-505S	Screw, binding head 3 x 12
–	MR-505N	Nut M3

TONE CONTROL PRINTED CARD BLOCK (MRA-509)

Ref. No.	Parts No.	Nomenclature
–	MRA-509	Tone Control Printed Card Assy. Comp.
3, 18	MRA-R601	Carbon Resistor RD1/4 15K (K)
8, 12	MRA-R602	Carbon Resistor RD1/4 6.8K (K)
9, 11	MRA-R603	Carbon Resistor RD1/4 3.9K (K)
10, 13	MRA-R604	Carbon Resistor RD1/4 6.8K (K)
19, 20	MRA-C601	Mylar Condenser 0.01μ (K) 50WV
14, 15	MRA-C602	Mylar Condenser 0.1μ (K) 50WV
6, 7	MRA-C603	Mylar Condenser 0.0022μ (K) 50WV
1, 2	MRA-C604	Mylar Condenser 0.022μ (K) 50WV
4, 17	MRA-VR601	Semi-variable Resistor V10K5 20KB
5, 16	MRA-VR602	Double Volume V24C 5GPHN-A50K x 2 20R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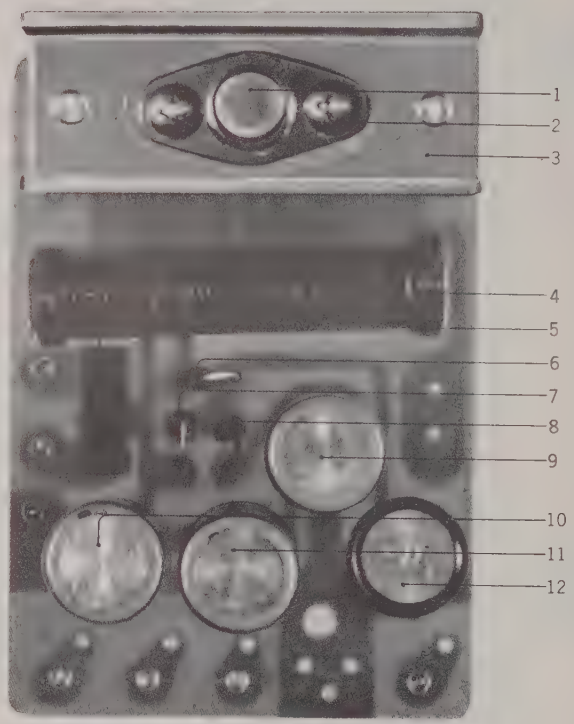
MAIN AMPLIFIER PRINTED CARD BLOCK (MRA-508) M-10

Ref. No.	Parts No.	Nomenclature	Unit Price (US)
–	MRA-508	Main Amp. Printed Card Assy. Comp.	
32, 57	MRA-TR501	Transistor 2SC372 hfe 120-250	
5, 22	MRA-TR502	Transistor 2SC971 with Cooler	
9, 18	MRA-T501	Driver Transformer N28-6370AT	
–	MRA-TH501	Thermister 19D46	
–	MRA-TH502	Thermister 19D46	
12, 15	MRA-VR501	Variable Resistor (Wire Wound Type) WR185-2K (PH) B100Ω	
10, 17	MRA-VR502	Variable Resistor (Wire Wound Type) WR185-2K (PH) B100Ω	
		Carbon Resistor (Insulator Type)	
35, 55	MRA-R501	RD1/4 1K (J)	
27, 61	MRA-R502	RD1/4 33K (J)	
34, 56	MRA-R503	RD1/4 5.6K (J)	
39, 51	MRA-R504	RD1/4 33K (J)	
1, 25	MRA-R505	RD1/4 560K (J)	
29, 60	MRA-R506	RD1/4 5.6K (J)	
36, 54	MRA-R507	RD1/4 1K (J)	
38, 50	MRA-R508	RD1/4 100Ω (J)	
2, 64	MRA-R509	RD1/4 8.2K (J)	
40, 49	MRA-R510	RD1/4 1.6K (J)	
8, 19	MRA-R512	RD1/4 68Ω (J)	
41, 48	MRA-R513	RD1/4 18Ω (J)	
44, 45	MRA-R514	RD1/4 18Ω (J)	
		Wire Wound Resistor	
4, 23	MRA-R511	3WL 390Ω (J)	
42, 46	MRA-R515	3WL 510Ω (J)	
43, 47	MRA-R516	3WL 510Ω (J)	
13, 14	MRA-R517	1/2WL 0.5Ω (K)	
11, 16	MRA-R518	1/2WL 0.5Ω (K)	
		Condenser	
26, 63	MRA-C501	Elect. Vert. mt. Type 33μ 25WV	
31, 58	MRA-C503	Elect. Vert. mt. Type 10μ 16WV	
30, 59	MRA-C505	Elect. Vert. mt. Type 22μ 16WV	
7, 20	MRA-C506	Elect. Vert. mt. Type 220μ 6.3WV	
3, 24	MRA-C508	Elect. Vert. mt. Type 330μ 25WV	
6, 21	MRA-C509	Elect. Vert. mt. Type 470μ 6.3WV	
33, 53	MRA-C502	VFM 470P (K) 50WV	
37, 54	MRA-C504	VFM 220P (K) 50WV	
28, 62	MRA-C507	VFM 220P (K) 50WV	
65	MRA-TC501	Plate, Transistor Cooler	
–	MRA-TR1	Transistor 2SD92 hfe 70-140	
–	MRA-TR2	Transistor 2SD92 hfe 70-140	
–	MRA-TC502	Screw, round head 3 x 8	
–	MRA-TC503	M3 Nut	
–	MRA-TC504	Prop, Printed Card mt.	
–	MRA-TC505	Screw, binding head 2.3 x 5	
–	MRA-TC506	M3 Lug Plate	

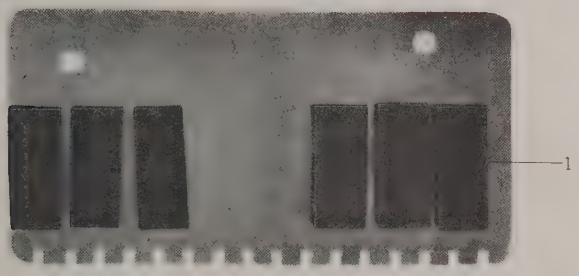
POWER SOURCE PRINTED CARD BLOCK (MRA-510) M-10



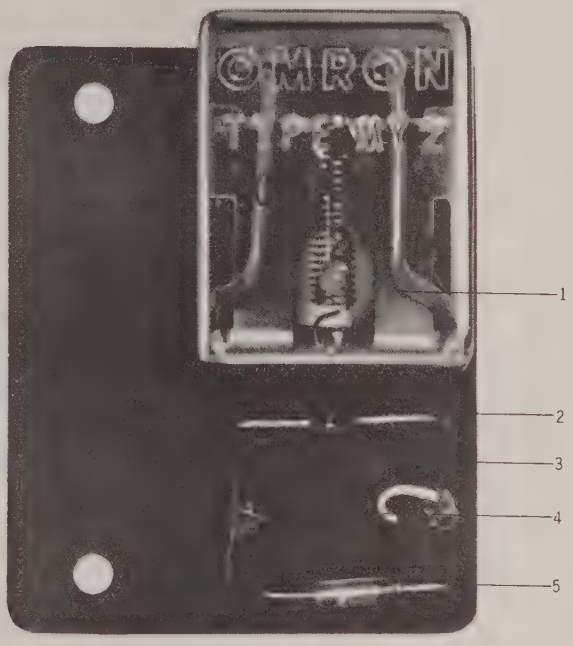
POWER SOURCE PRINTED CARD BLOCK (MRA-510)

Ref. No.	Parts No.	Nomenclature
–	MRA-510	Power Source Printed Card Assy. Comp.
1	MRA-TR401	Transistor 2SC223 (Y)
3	MRA-TC401	Transistor Cooler for 2SC223
2	MRA-TC402	Screw, binding head 3 x 8
–	MRA-TC403	M3 Nut
5	MRA-D401	Silicon Diode SB-3-01P
8	MRA-D402	Zener Diode RD-24V (M)
4	MRA-R401	Wire-wound Resistor L Type 5WL 22Ω (K)
7	MRA-R402	Carbon Resistor with Stopper RD1/4 5.1K (J)
6	MRA-R403	Carbon Resistor with Stopper RD1/4 47Ω (K)
9	MRA-C401	Elect. Condenser Vert. mt. Type 100μ 50WV
10	MRA-C402	Elect. Condenser Vert. mt. Type 100μ 50WV
11	MRA-C403	Elect. Condenser Vert. mt. Type 100μ 50WV
12	MRA-C404	Elect Condenser Vert. mt. Type 220μ 25WV

SPARK QUENCHER PRINTED CARD BLOCK (MR-507)



TENSION RELAY PRINTED CARD BLOCK (MR-552)



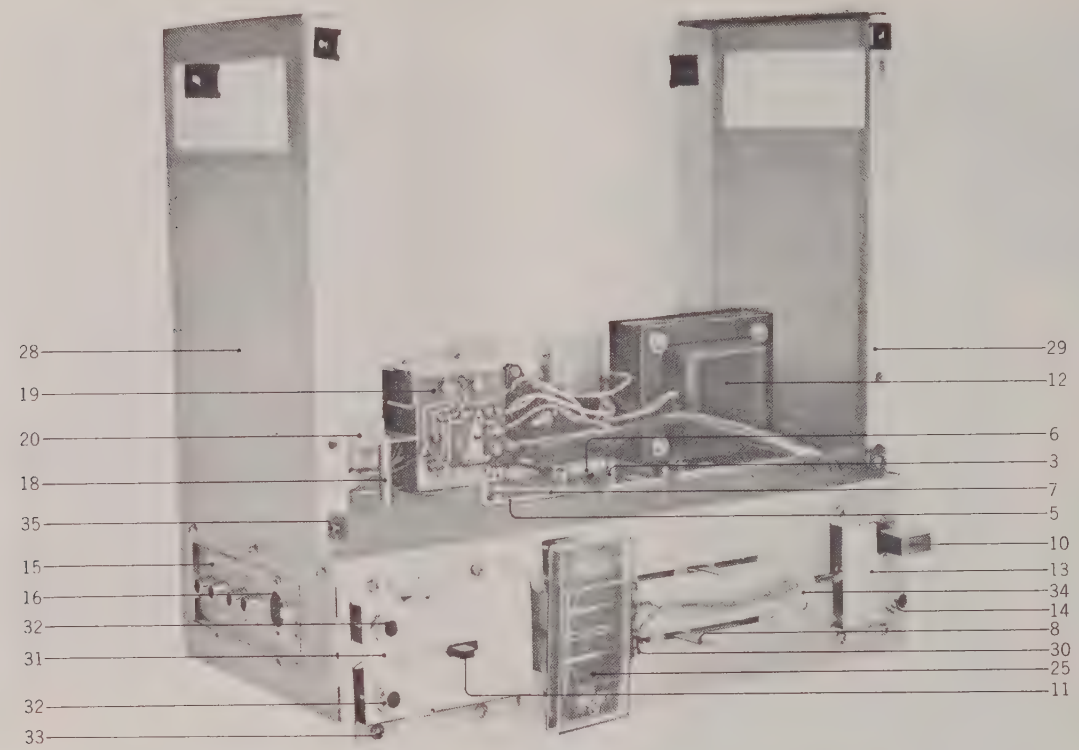
SPARK QUENCHER PRINTED CARD BLOCK (MR-507)

Ref. No.	Parts No.	Nomenclature
1	MR-507	Spark Quencher Printed Card Assy. Comp.
2	MR-CR001	Spark Quencher 0.033μ + 120Ω 500WV

TENSION RELAY PRINTED CARD BLOCK (MR-552)

Ref. No.	Parts No.	Nomenclature
—	MR-552	Tension Relay Printed Card Assy. Comp.
4	MR-TR0401	Transistor 2SC372
1	MR-RL0401	Relay MY2-0-AD-6 24V 650Ω
5	MR-D0401	Germanium Diode IN34A
2	MR-D0402	Silicon Diode V06C or 10D1
3	MR-R0401	Carbon Resistor with Stopper RD1/4 22K

X-200D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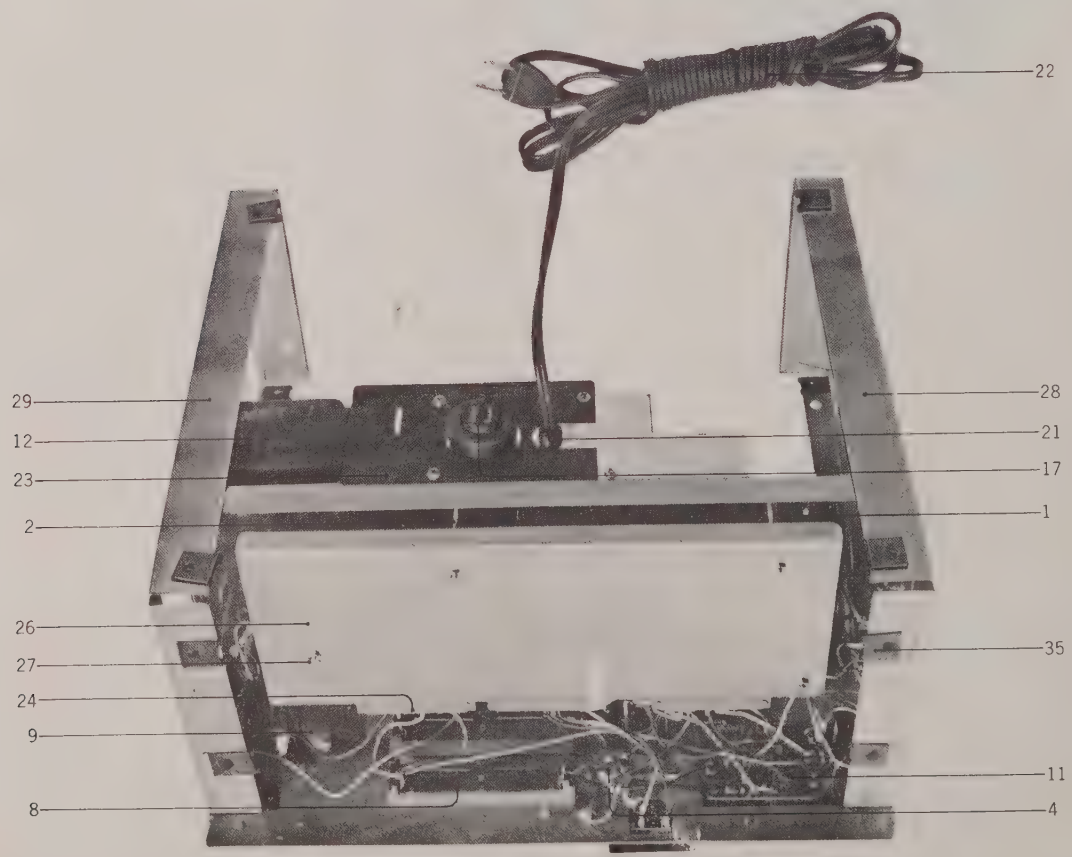
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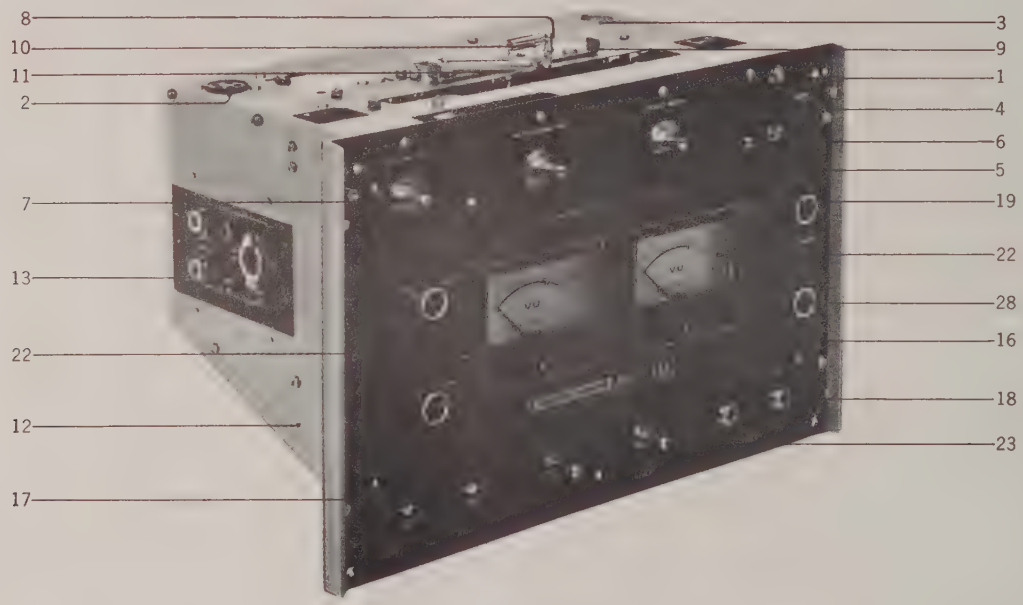
AMPLIFIER ASSEMBLY BLOCK **X-200D**

Ref. No.	Parts No.	Nomenclature
1	MRD-A002	5P TV Consent Socket
–	MRD-A003	Screw, binding head 3 x 5
2	MRD-A004	Prop A, Amp.
–	MRD-A005	Prop B, Amp.
–	MRD-A007	M3 Lug Plate
–	MRD-A008	Tapping Screw (2 types) 3 x 6 round head
–	MRD-A012	Lever B, REC/PB
3	MRD-A013	Pin, REC/PB Lever
–	MRD-A014	Retaning Washer M4
–	MRD-A015	M4 Nut
–	MRD-A016	Spaser, REC/PB Switch
–	MRD-A018	Set Screw, Amp. Lever
–	MRD-A020	M3 Nut
4	MRD-A021	Lamp Holder
–	MRD-A022	Lamp No. 2 8V 0.2A
–	MRD-A023	Screw, binding head 3 x 8
5	MRD-A026	Lever A, REC/PB
6	MRD-A030	Spring, REC/PB Lever
7	MRD-A031	Spring C
8	MRD-A032	Slide Volume LV601* BR-40-50KΩ (A)
–	MRD-A033	Screw, binding head 3 x 4
–	MRD-A034	Push Switch UEH-12BP (POWER)
9	MRD-A035	Spark Quencher 0.033 + 120Ω 500WV
10	MRD-A036	Knob, Push Switch
–	MRD-A037	Set Screw, Push Switch
11	MR-502	Equalization Printed Card Assy. Comp.
12	MRD-A040	Power Transformer MRT-1
–	MRD-A041	Tapping Screw (1 type) 4 x 8 round head
–	MRD-A042	Nylon Clip HP-2N
13	MRD-A044	Jack Base B
14	MRD-A045	3PM Jack S
–	MRD-A046	M9 Retaining Washer
–	MRD-A048	Nut, E Jack
15	MRD-A901	MRD Line Jack Plate Assy. Comp.
16	MRD-A911	DIN Jack
17	MRD-1002	Consent, Power Selector
–	MRD-1003	Fuse ST-2 2A
–	MRD-1004	Screw, truse head 3 x 6
18	MRD-1005	Prop A, Amp.
19	MR-503	Power Source Printed Card Assy. Comp.
20	MRD-1021	6P Socket
21	MRD-1023	Strain Bushing for AC Cord SR 2P-1
–	MRD-1024	Strain Bushing for AC Cord 6W-1
22	MRD-1025	AC Cord U/L 3m
23	MRD-Z001	Back Plate
–	MRD-A053	Connector Base
24	MRD-A054	10P Multi-Jack
–	MRD-A055	Screw, Pan head 2.3 x 10
25	MRD-A060	VU Meter MG-202
26	MRD-A061	Shild, Pre-Amp. Card
–	MRD-A059	Prop. Shild Plate
27	MRD-A062	M3 Nut
28	MRD-A063	Side Plate (Left)
29	MRD-A067	Side Plate (Right)
30	MRD-A069	Lug Plate VBILI
–	MRD-A022	Lamp No. 2 8V 0.2A
31	MRD-A811	Jack Base A
32	MRD-A812	2PM Jack S
–	MRD-A813	M9 Retaining Washer
–	MRD-A815	Nut, E Jack
–	MRD-A816	Screw, Pan head 2.6 x 4
–	MRD-A817	Carbon Resistor RD1/4 1K (K)
33	MRD-A008	Tapping Screw (2 types) 3 x 6 round head
34	MRD-A042	Nylon Clip HP-2N
35	MRD-A003	Speed Nut (U types) M4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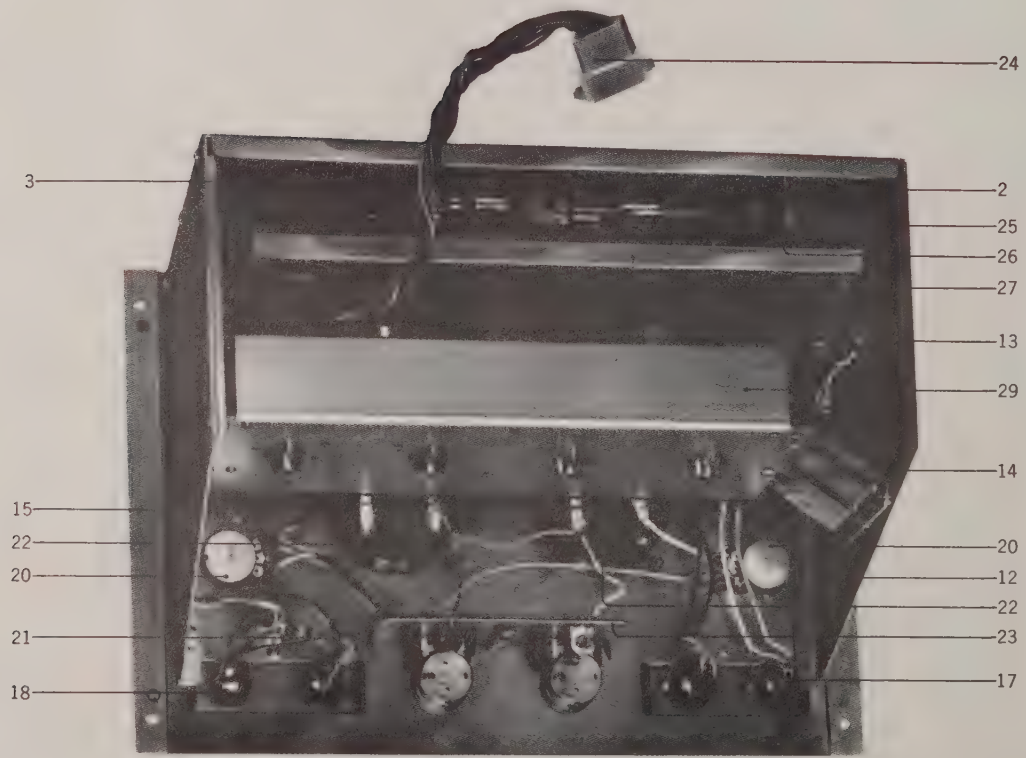
M-10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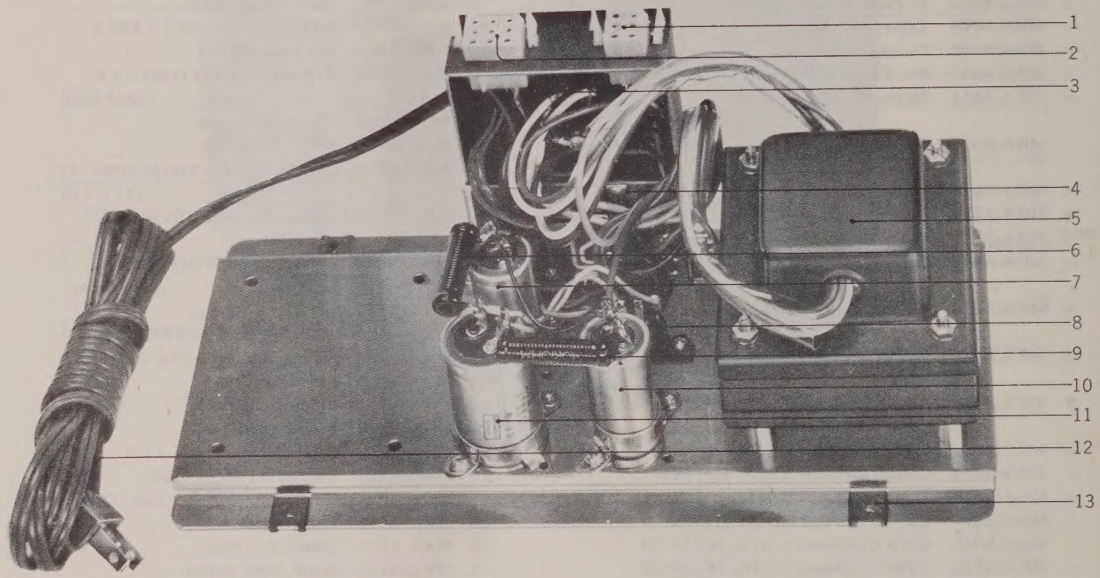
AMPLIFIER ASSEMBLY BLOCK **M-10**

Ref. No.	Parts No.	Nomenclature
1	MRA-A002	Prop A, Amplifier
–	MRA-A003	Screw, binding head 3 x 5
2	MRA-A004	5P TV Consent Socket
3	MRA-A006	4P Jack
–	MRA-A008	Table, Rec. Lamp
–	MRA-A009	Lamp Printed Card
–	MRA-A010	No. 2 Lamp 8V 0.2A
–	MRA-A011	Screw, binding head 3 x 5 with Washer
–	MRA-A012	Tapping Screw (2 type) 3 x 6 round head
4	MRA-A013	Push Button Switch Assy. Comp.
–	MRA-A014	Push Switch UEH-12BP
–	MRA-A015	Table, Power Switch
–	MRA-A017	Spark Quencher 0.033 + 120Ω 500WV
5	MRA-A018	Rotary Switch SR26N-1•3•3 (SOS)
6	MRA-A019	Rotary Switch SR26N-1•4•2 (ST)
7	MRA-A020	Rotary Switch SR26N-3•6•3 (EQ)
–	MRA-A021	Carbon Resistor RD1/4 8.2K (J)
–	MRA-A022	Carbon Resistor RD1/4 82K (K)
–	MRA-A023	Carbon Resistor RD1/4 22K (K)
–	MRA-A024	Carbon Resistor RD1/4 47K (K)
–	MRA-A025	Mylar Condenser 0.015μ (K) 50WV
–	MRA-A026	Mylar Condenser 0.056μ (K) 50WV
–	MRA-A027	VFM Condenser 100P (K) 50WV
–	MRA-A028	Hi-Q Condenser 620P (K) 50WV
–	MRA-A029	Arm, Sound on Sound
–	MRA-A033	SOS Lever B with Pin
–	MRA-A036	Cam Roller A
–	MRA-A037	"U" Ring 2.85 mm
–	MRA-A038	Spring, Brake Lever
–	MRA-A039	Screw, MR-254
–	MRA-A040	Retaining Washer M3
–	MRA-A041	M3 Nut
–	MRA-A042	SOS Lever A
–	MRA-A046	SOS Spoke
–	MRA-A047	Rec. Lever B
–	MRA-A048	MRA Coupler
8	MRA-A050	Pin, Rec. Lever
–	MRA-A051	Retaining Washer M4
–	MRA-A052	M4 Nut
–	MRA-A053	Set Screw 3A-737
–	MRA-A056	SOS Lever D
–	MRA-A059	SOS Lever C
9	MRA-A064	Rec. Lever A
10	MRA-A068	Spring A, Rec. Lever
–	MRA-A069	M3 Lug Plate
11	MRA-A072	Spring, Rec. Lever Tension
12	MRA-A073	Left Side Plate
–	MRA-A074	Holder, Connecter Base
13	MRA-A901	Jack Plate Assy. Comp.
–	MRA-A902	Carbon Resistor RD1/4 10K (K) (R301, 2)
–	MRA-A903	Carbon Resistor RD1/4 22K (K) (R303, 4)
–	MRA-A904	Carbon Resistor RD1/4 27K (K) (R305, 6)
–	MRA-A905	Carbon Resistor RD1/4 150K (K) (R307, 8)
14	MRA-A078	Holder B, Main Amp.
15	MRA-A081	Right Side Plate
–	MRA-A084	Holder A, Main Amp.
16	MRA-A086	Panel, MRA Amp.
17	MRA-A088	2PM Jack S
–	MRA-A091	Nut, E Jack
18	MRA-A092	3P64M Jack
19	MRA-A096	Escutcheon, Acryl
20	MRA-A097	Volume V24N-50KA-4 50KA
21	MRA-A098	Lug Plate KP1L1
–	MRA-A099	Tapping Screw (2 type) 3 x 6 round head
22	MRA-A100	VU Meter VH-10
–	MRA-A101	Spring, Meter mt.
–	MRA-A103	Carbon Resistor RD1/4 150Ω (K) (R11, 12)
–	MRA-A104	Carbon Resistor RD1/4 1K (K) (R1, 4)
23	MRA-509	Tone Control Printed Card Assy. Comp.
–	MRA-A108	Connecter Base A
–	MRA-A109	10P Multi-Jack 500-010-005
–	MRA-A110	Screw, binding head 2.3 x 10
24	MRA-A112	9P Socket
–	MRA-A114	Connecter Base B
–	MRA-A118	Nylon Clip HP-4N
–	MRA-A119	Screw, binding head 3 x 8
25	MR-501	Pre-Amp. Printed Card Assy. Comp.
26	MRA-A121	Prop, Shield
27	MRA-A122	Shield, Pre-Amp.
4	MRA-A126	Knob, Push Button
28	MRA-A127	Knob, Amp.
29	MR-508	Main Amp. Printed Card Assy. Comp.



POWER SOURCE BLOCK

Ref. No.	Parts No.	Nomenclature
5	MRA-1002	Power Transformer MRT-3
–	MRA-1003	Screw, Pan head 4 x 8
11	MRA-1005	Elect. Condenser 1000μ 63WV (C-701)
7, 10	MRA-1006	Elect. Condenser 1000μ 35WV (C-702, 3)
–	MRA-1007	Tapping Screw (2 type) 3 x 6 round head
6, 9	MRA-1008	Wire-wound Resistor (L type) 4WL 4Ω (J)
8	MRA-1009	Silicon Diode 5B2 (D-701)
–	MRA-1010	Tapping Screw (2 type) 3 x 12 round head
3	MRA-1012	Receptacle Socket (Voltage Selector)
–	MRA-1013	Screw, truse head 3 x 6
–	MRA-1014	Fuse ST-2 3A
1	MRA-1015	6P Plug
2	MRA-1017	9P Plug
–	MRA-1020	Screw, binding head 3 x 5 with Washer
4	MRA-510	Power Source Printed Card Assy. Comp.
–	MRA-1007	Screw, binding head 3 x 5 with Washer
13	MRA-1024	Speed Nut M4 (1 type)
–	MRA-1025	Strain Bushing for AC Cord SR2P-1
12	MRA-1027	U/L AC Cord 3 m
–	MRA-1026	Strain Bushing for AC Cord SR-6W-1

MP MASTER
MA32771